

OCCASIONAL PAPERS
OF THE
California Academy of Sciences

No. 88, 65 pages, 30 figures.

NEW SCENOPINIDAE (Diptera) FROM NORTH AMERICA

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Since the completion of "A Revision of the Scenopinidae (Diptera) of the World" (Kelsey, 1969)², the author has continued to receive additional specimens for identification. Among these were the 30 species new to science whose descriptions are included in this paper. Represented are members of four of the five North American genera. These additions bring to 127 the described North American (including Mexican) species. The fact that these comprise nearly half of the known species of the family is undoubtedly a reflection of more intensive collecting rather than of actual distribution of the group.

The author is indebted to the following institutions and persons for furnishing the material for this study:

University of California, Riverside, particularly Michael Irwin and Dr. Evert I. Schlinger;

Canadian National Collection, Ottawa, J. R. Vockeroth;
United States National Museum, Washington, D. C., W. W. Wirth; and

Washington State University, Pullman, Dr. M. T. James.

The keys to the North American genera have been revised to include all of the new species.

1. Published as Miscellaneous Publication no. 621 with the approval of the Director of the Delaware Agricultural Experiment Station. Publication no. 402 of the Department of Entomology and Applied Ecology.

2. United States National Museum Bulletin, no. 277: 336 pp., 210 figs.

In the illustrations of the new species, the scale marks on the plates equal 1/2 mm. The shorter mark applies to the wing and head, while the longer relates to the terminalia and enlarged details of the head and antenna.

GENUS SCENOPINUS Latreille

Kelsey (1969) recognized 37 species in the genus Scenopinus from North America including Mexico. Of these, seven were of the Fenestralis Group and 30 of the Velutinus Group. The addition of the material described here increases the number of North American species by three for the former group, and by six for the latter, for a total of 46 Scenopinus species found in North America.

FENESTRALIS GROUP

As all three of the new species would run to S. undulafrons Kelsey in the keys to the Nearctic species (Kelsey, 1969 p.16), the following key has been prepared to include all species.

1. Antennae long and narrow 2
Antennae short, pear-shaped 4
2. (1) Wings hyaline, halter knob white to brown 3
Wings smoky gray, halter knob yellow-brown
. S. schroderi (Krober)
3. (2) Frons shining, halter knob white, legs orange-
brown S. glabrifrons Meigen
Frons rugose, halter knob brown to white, legs
red-brown S. fenestralis (Linneaus)
4. (1) Vein R₄ branching before the middle of cell R₅ 5
Vein R₄ branching at the middle of cell R₅
. S. acquelonius Kelsey
5. (4) Vein R₄ branching from near the middle of cell R₅ 6
Vein R₄ branching from the basal fourth of cell
R₅ S. breviterminus Kelsey
6. (5) Halter knob red-brown 7
Halter knob of female black, of male dark
red-brown with lighter base
. S. vockerothi Kelsey, new species
7. (6) Antennae with last segment red-brown 8
Antennae with last segment black or black-
brown 9
8. (7) Vein R₄ branching well beyond the line of the
m crossvein extended S. undulafrons Kelsey
Vein R₄ branching from a point on line of m
crossvein extended S. estesi Kelsey, new species
9. (7) Antennae with last segment black; a deep
transverse groove on lower frons
. S. transversus Kelsey, new species
Antennae with last segment black-brown;
lower frons smoothly rounded with a shallow
median groove S. nidorcaupulus Kelsey

Scenopinus estesi Kelsey, new species.
(Figure 1.)

MALE. Head black; eyes red-brown above, black-brown below, extending to the back side of head; frons narrow, a transverse depression with a central and two lateral points that make it look like a crown on the lower frons over the antennae; silvery pile surrounding the oral opening extending in a narrow band over the antennal bases; mouthparts brown, two-thirds the length of the oral opening; palpi red-brown, slender, shorter than mouthparts; ocellar tubercle black, prominent; ocelli red-brown; antennae dark red-brown, third segment oval, truncated at the tip, and only twice as long as broad; see figures for details.

Thorax black-brown dorsally, supraalar calli red-brown, pleural areas dark red-brown; wings brownish hyaline, veins brown, R₄ branching from before the middle of cell on a line with the m crossvein extended; halter stem red-brown, knob red-brown; fore legs with femora dark red-brown, tibiae red-brown, tarsi orange, darkening distally; middle and hind legs with femora and tibiae dark red-brown, tarsi orange, darkening distally, femoro-tibial knees orange.

Abdomen black-brown; white membranous bands on segments 3-6 very narrow (best seen from posterior aspect), terminalia black-brown; much like S. fenestralis externally but differs in accessory glands and apodemes internally; see figures for details.

FEMALE. Unknown.

LENGTH. Male body 4.3 mm. wing 3.2 mm.

TYPE LOCALITY. Stony Creek, Sequoia National Park, California; 15 June 1964 in wet log, emerged 1 August 1964 (P. M. Estes).

TYPE DEPOSITED. California Academy of Sciences no.10117 (ex University of California, Riverside).

Scenopinus transversus Kelsey, new species.
(Figure 2.)

FEMALE. Head black; eyes black-brown; postocular ridge moderately wide, elevated on the posterior edge; frons moderately broad, nearly twice as wide as the ocellar tubercle, rugose, with a median groove bordered by transverse striations and a transverse depression above the antennal sockets; mouthparts brown, well developed; palpi black, half as long as the oral opening; ocellar tubercle black, not set off; ocelli brown; antennae black, third segment pilose, pear shaped, barely twice as long as wide; see figures for details.

Thorax black, rugose with short silvery hairs; humeral and supraalar calli red-brown; mesoscutellum not distinctly set off from the notum; pleural areas black-brown; wings smoky brown hyaline, veins brown, R₄ distal to the extension of the m cross vein extending straight to the edge of the wing; halter stem black-brown, knob red-brown; legs with femora and tibiae dark red-brown with orange-brown knees, tarsi orange-brown.

Abdomen black, rugose, subshining. See figures for conformation of 8th sternum, and 9th sternum and bursa.

MALE. Unknown.

LENGTH. Female body 4.8 mm., wing 3.2 mm.

TYPE LOCALITY. Sagehen Creek near Hobart Mills, Nevada County, California. 15 July 1964 (M. E. Irwin); Malaise trap in meadow.

TYPE DEPOSITED. California Academy of Sciences, no. 10119, (ex University of California, Riverside).

PARATYPE. 1 female same data except 18 July 1962, (R. M. Bohart) in University of California, Riverside.

Scenopinus vockerothi Kelsey, new species.

(Figure 3.)

MALE. Head black; eyes red-brown above, black-brown below, extending to back of head; frons triangular, extending to median ocellus, upper portion nearly as wide as median ocellus, roughened, dull but not striated, a very faint midline on lower frons; ocellar tubercle black; ocelli orange; back of head concave; mouthparts red-brown, filling oral cavity; palpi red-brown, slender, more than half the length of the oral cavity; antennae black-brown, third segment oval, not twice as long as broad; see figure.

Thorax, black, rugose, subshining; humeral and supraalar calli tipped red-brown; pleural areas black, except below wing red-brown, rugose; wing hyaline, veins brown, R_4 branching before the middle of cell R_5 ; halter stem brown, knob dark red-brown with lighter base; legs dark red-brown except tarsi orange-brown with tips and claws red-brown.

Abdomen black-brown with thin white membranous bands behind segments 3-5, 9th tergum four-lobed; see figure for details.

FEMALE. Head black; eyes black, with moderately broad, shining postocular rim; frons broad, wider than ocellar tubercle and rugose except shining along the eye margins and median band, with a slight depression at the middle and two bulges on the lower frons; ocellar tubercle black; ocelli red-orange; antennae black, third segment tapering and not twice as long as broad; see figures for details.

Thorax, black, rugose; humeral and supraalar calli red-brown; pleura black, rugose; wings brownish, veins brown, R_4 undulating to edge of wing from a point only slightly distal to the line of the m crossvein extended; halter stem brown, knob black; legs black except femoro-tibial joints orange, tarsi orange, darkening to red-brown distally.

Abdomen, broad, shining, and black, except central portion covered with brown pollen.

LENGTH. Male body 3.8 mm., wing 2.8 mm., female body 4.6 mm., wing 3.3 mm.

TYPE LOCALITY. Old Chelsea, Quebec, Canada. Summit of King Mountain 1150', July, 1964 (J. R. Vockeroth).

ALLOTYPE. Female, Stittsville, Ontario, Canada, 26 July 1965 (J. R. Vockeroth).

TYPE AND ALLOTYPE DEPOSITED. Canadian National Collection no. 11428.

VELUTINUS GROUP

The following revisions of keys to the Nearctic species (males) (Kelsey 1969, p. 110) will permit the determination of all known males. The key to the females is completely revised.

Nearctic Species (Males)

- 14.(12) Halter knob completely or partially brown to black 14a
- Halter knob completely or partially red-brown 15
- 14a(14) Halter knob all brown to black. . S. valgus (D.E.Hardy)
- Halter knob brown with ventral tip white
- S. reciprocatus Kelsey, new species (in part)
- 25.(24) Halter knob all brown or brown with a lighter ventral area 26
- Halter knob all red-brown, or with cream ventral surface, or cream with a flush of red-brown at base 27
- 26.(25) Halter knob all brown, hind margin of 9th tergum produced at the midpoint . . . S. cooki Kelsey
- Halter knob brown to black-brown above, a white lateral band and a ventral tip separating it from a lighter brown ventral surface, 9th tergum with posterior margin straight S. johnsoni Kelsey, new species
- 27.(25) Halter knob all red-brown 28
- Halter knob red-brown above, cream below or cream with flush of red-brown at base, 9th tergum truncate
- S. reciprocatus Kelsey, new species (in part)
- 28.(27) Third antennal segment short S. barberi Kelsey
- Third antennal segment long and narrow
- S. butleri Kelsey

Nearctic Species (Females)

- 1. Wings hyaline 2
- Wings brown or white 11
- 2. (1) Halter knob white 3
- Halter knob not white 5
- 3. (2) Palpi dark 4
- Palpi orange . . . S. aurantipalpus Kelsey, new species
- 4. (3) Lateral depressions on 8th tergum and sternum S. beameri (D.E. Hardy)
- No lateral depressions on 8th tergum
- S. whittakeri James
- 5. (2) Halter knob brown or red-brown 6
- Halter knob tan or yellow 9
- 6. (5) Cell R5 tapering to margin of wing 7
- Cell R5 sharply constricted before margin of wing S. gossypius Kelsey
- 7. (6) Legs with tibiae red-brown 8
- Legs with tibiae orange-brown to brown S. magdalenai Kelsey

8. (7) Eighth tergum flat, with lateral
depressions S. beameri fuscus (D.E.Hardy)
Eighth tergum rounded and without
depressions S. valgus (D.E.Hardy)
9. (5) Halter knob tan 10
Halter knob yellow, tip of cell R₅ open
. S. mirabilis Adams
10. (9) Antennae red-brown, third segment elongate,
more than twice as long as broad . S. howdeni Kelsey
Antennae brown, third segment oval and barely
twice as long as broad
. S. dietricki Kelsey, new species
11. (1) Wings brown or smoky brown 12
Wings white or smoky white 21
12. (11) Halter knob white to tan 13
Halter knob dark 15
13. (12) Halter knob cream or tan 14
Halter knob white S. vanduzeei Kelsey
14. (13) Halter knob cream, antennae long,
straight S. kuiterti (D.E.Hardy)
Halter knob tan, antennae short,
pear-shaped S. cochisei Kelsey
15. (12) Cell R₅ narrowed at margin of wing 16
Cell R₅ open at margin of wing 19
16. (15) Halter knob red-brown to black-brown,
marked or lighter below 17
Halter knob red-brown to black-brown,
polished S. nubilipes Say
17. (16) Halter knob brown or black-brown 18
Halter knob red-brown above, white
below S. hagai Kelsey
18. (17) Halter knob black-brown above, with a white
lateral band and ventral tip, remainder of lower
surface red-brown . . S. johnsoni Kelsey, new species
Halter knob brown above, ventral tip of knob
light . S. reciprocatus Kelsey, new species (in part)
19. (15) Halter knob entirely brown or red-brown 20
Halter knob red-brown and velvety above,
tan below S. foxi Kelsey, new species
20. (19) Halter knob light red-brown, tarsi light
red-brown S. bryanti Kelsey
Halter knob brown, tarsi straw
yellow S. flandersi Kelsey
21. (11) Halter knob partially or entirely white 22
Halter knob partially or entirely yellow to brown 26
22. (21) Halter knob all white 23
Halter knob white with base tan S. weemsi Kelsey
23. (22) Body without flattened scales 24
Body with flattened scales
. S. albifasciatus (D. E. Hardy)
24. (23) Third antennal segment not parallel-sided 25
Third antennal segment uniform in
width S. chico Kelsey
25. (24) Third antennal segment oval, widest at
the middle S. alalacteus Kelsey
Third antennal segment pear-shaped, widest
at base S. cretatus Kelsey
26. (21) Halter knob brown or red-brown 28
Halter knob lighter 27

27. (26) Halter knob orange-yellow, thorax without
white hairs S. seftoni Kelsey
Halter knob dark tan to light orange-brown,
thorax covered with short white hair
. S. albipilosus Kelsey, new species
28. (26) Halter knob entirely red-brown 29
Halter knob brown or red-brown above,
lighter below 30
29. (28) Antennae black-brown, elongate oval; frons
swollen above antennal bases and with a broad
median depression on lower fourth . . S. rossi Kelsey
Antennae red-brown, short; frons swollen above
antennal bases, a median groove dividing
lower two-fifths S. barberi Kelsey
30. (28) Halter knob brown above, white below . S. pecki Kelsey
Halter knob red-brown above, ventral portion
cream diffused with brown
. S. reciprocatus Kelsey, new species (in part)

Scenopinus albipilosus Kelsey, new species.

(Figure 4.)

FEMALE. Head black; eyes red-brown; postocular ridge very narrow; frons rugose, swollen above antennae, broader than the ocellar tubercle, with a subshining median band and with short white hairs on the lateral portions; ocellar tubercle black, not distinctly set off; ocelli clear; mouthparts well developed, nearly filling the oral cavity; labellum brown; palpi large, paddle-shaped, clothed with short white hairs laterally; oral cavity bordered by white pubescence which extends over the antennal bases, genae below eyes shining; antennae with first two segments red-brown, granular; third segment lost on the specimen; see figures for details.

Thorax black, rugose, covered with sparse but noticeable short white hairs; humeral and supraalar calli orange; pleural areas black-brown with white hairs; wings milky white, opaque, with brown veins; halter stem brown, knob dark tan to light orange-brown; legs with coxae to tibiae red-brown and covered with short white hairs; tarsi and knees light orange-brown.

Abdomen, dark red-brown with short white hairs that are particularly noticeable at posterior end. See figures for details of 8th sternum, and 9th sternum and bursal cavity.

MALE. Unknown.

LENGTH. Female body 3.7 mm., wing 2.6 mm.

TYPE LOCALITY. El Centro, Imperial County, California, 10 June 1954, (R.A. Flock).

TYPE DEPOSITED. California Academy of Sciences, no.10114, (ex University of California, Riverside).

Scenopinus aurantipalpus Kelsey, new species.

(Figure 5.)

FEMALE. Head black-brown; eyes red-brown with a narrow

postocular ridge; frons broad, granular with a flattened median depression; ocellar tubercle black-brown, ocelli orange-brown; oral margin behind and below the antennae polinose, mouthparts red-brown, palpi with base red-brown, distal portion large, fleshy, orange colored, easily visible; antennae with two basal segments black-brown, third segment elongate tapering, orange-brown basally, black-brown distally, and half as long as the head is high; see figures for details.

Thorax black-brown, dorsum rugose with sparse hairs; humeral and supraalar calli red-brown; wings hyaline with tan-brown veins; halter stem brown, knob white; legs red-brown, lightening distally.

Abdomen red-brown subshining. See figures for details of 8th sternum, 9th sternum, and bursal cavity.

MALE. Unknown.

LENGTH. Female body 2.7-3.2 mm., wing 2.0 mm.

TYPE LOCALITY. Deep canyon, Riverside, California, 9 August 1963 (E. I. Schlinger).

TYPE DEPOSITED. California Academy of Sciences, no. 10115 (ex University of California, Riverside).

Scenopinus dietricki Kelsey, new species.
(Figure 6.)

FEMALE. Head black; eyes black-brown with a narrow postocular ridge; frons rugose, with a central elevated ridge that has a shallow depressed midline and with a few hairs; gray pubescence extending from the border of the oral cavity to above the antennae; genae subshining; ocellar tubercle black, not distinctly set off; ocelli orange; back of head concave, undercutting the ocellar tubercle; mouthparts brown, well developed, and extending to end of oral cavity; palpi brown, only a little more than half as long as the mouthparts; antennae brown, first two segments short, third oval and only a little more than twice as long as broad; see figures for details.

Thorax black, rugose; humeral and supraalar calli tan; mesoscutellum black in anterior half, red-brown in posterior half, and with a transverse median depression; pleural areas red-brown; wings hyaline with brown microtrichia and light brown veins; halter stem brown, knob tan above and lighter below; legs with femora and tibiae red-brown with yellow knees; tarsi yellow, darkening at tips.

Abdomen, dark red-brown, 8th segment with sparse long hairs. See figures for conformation of 8th and 9th sterna and bursal cavity.

MALE. Unknown.

LENGTH. Female body 3.5 mm., wing 2.2 mm.

TYPE LOCALITY. Indio, Riverside County, California, 20 July 1962. (E. J. Dietrich) on tomato.

TYPE DEPOSITED. California Academy of Sciences, no. 10116 (ex University of California, Riverside).

Scenopinus foxi Kelsey, new species.

(Figure 7.)

FEMALE. Head dark red-brown; eyes brown with golden glints and a well developed postocular ridge; eye margins separated above from the ocellar tubercle by a space equal to width of the tubercle; frons broad, rugose, with prominent swellings above the antennal bases and deeply cleft by a groove that ends in a shallow pit on the lower third of the frons; ocellar tubercle not prominent, ocelli orange; mouthparts brown, well developed, filling two thirds of oral opening; palpi subequal to mouthparts; antennae brown, the first two segments short, the third oval, with a pile of hairs and about twice as long as wide; see figures for details.

Thorax red-brown; humeral callus with tip orange; supraalar callus orange; mesoscutellum lighter in color than scutum; wings a faint smoky brown, the veins light brown; halter stem brown, knob red-brown and velvety above, tan below; legs red-brown with lighter colored tarsi, the hind tarsi straw yellow.

Abdomen red-brown, its 8th segment dark red-brown. See figures for details of 8th and 9th sterna and bursal cavity.

MALE. Unknown.

LENGTH. Female body 2.7 mm., wing 2.1 mm.

TYPE LOCALITY. Hollister, Idaho, 13 June 1931 (D. E. Fox), Plot 6 outside.

TYPE DEPOSITED. United States National Museum, no. 70816.

Scenopinus johnsoni Kelsey, new species.

(Figure 8.)

This species is represented by a series of 65 specimens, nearly equally divided between males and females, taken from the nests of Ectemnius spiniferus (Fox) (Hymenoptera, Crabronidae) in cotton stems, pointing up again the fact that scenopinids can be taken in abundance at the proper place and time.

MALE. Head black; eyes red-brown above, black-brown below, and extending around to the back side of the head; frons narrow, triangular, extending half the distance from the antennae to the median ocellus, rugose with a central depression on the upper fourth; ocellar tubercle black-brown, subshining; ocelli brown; back of head concave; genae small, shining; mouthparts brown, well developed; palpi black-brown, slender, half as long as oral opening; oral opening bordered by silvery pile that extends dorsally above the bases of the antennae; antennae black-brown, first two segments short, third segment oval, twice as long as wide, pilose, and with a blunt tip. See figures for details.

Thorax black-brown, a patch of silvery pile above the humeral callus, and a few sparse hairs over the remainder; humeral callus with a small red-brown tip, supraalar callus tan; pleurum dark red-brown; wings milky white, the veins tan becoming fainter behind; halter stem brown, knob brown to black-brown above, with a white lateral band and ventral tip; remainder of lower surface a lighter brown, legs with coxae through tibiae dark black-brown, tarsi yellow-brown, darkening

to brown distally and posteriorly.

Abdomen black-brown, broad, segments 2 to 4 with narrow white membranous posterior borders; aedeagal parameres weak. See figures for details of 9th tergum and ejaculatory pump.

FEMALE. Head black-brown; eyes red-brown, with a moderately wide postocular ridge which is glabrous near the eye and rugose distally; frons rugose, swollen, with a distinct median groove that fades on the upper fourth of the frons; back of head concave; mouthparts as in the male; ocellar tubercle black-brown; ocelli clear to red-brown; antennae as in the male. See figures for details.

Thorax as in the male, except humeral callus with orange tip; wings brownish hyaline, the veins brown, darker and stronger than in the male; halter stem brown, knob black-brown above with a white lateral band and ventral tip, remainder of the lower surface red-brown; legs as in the male.

Abdomen black-brown, shining, 8th segment black-brown, sternum excavated on midline. See figures for conformation of 8th and 9th sterna and bursal cavity.

LENGTH. Male body 2.6-3 mm., wing 2 mm. Female body 3.4-3.8 mm., wing 2.3 mm.

TYPE LOCALITY. 3 miles North of Madera, Madera County, California, 30 September 1965, (C. Johnson) from cells of Ectemnius spiniferus (Fox) in cotton stems.

ALLOTYPE. Female: same data as male.

TYPE DEPOSITED. California Academy of Sciences, no. 10118 (ex University of California, Riverside).

PARATYPES. 31 males and 32 females deposited as follows: 20 males, 21 females in University of California, Riverside; 2 males, 2 females in United States National Museum; 2 males, 2 females in Snow Museum, Lawrence, Kansas; 4 males, 4 females in University of Delaware, 1 male, 1 female in University of California, Davis, 1 male, 1 female in University of California, Berkeley.

Scenopinus reciprocatus Kelsey, new species.
(Figure 9.)

This species is distinguished by cell R_5 being sharply constricted near its apex. The shape of this cell is not as bottle-like as in S. gossypius, yet the constriction is more pronounced than in S. flandersi. The truncate posterior margin of the 9th tergum of the male, though similar to those of the above mentioned species, differs from the former in the short aedeagal parameres, larger ejaculatory mechanism and accessory glands, and from the latter in the more pointed claspers on the 9th segment. Though readily recognized as being distinct from S. gossypius and S. flandersi, this species has been difficult to classify owing to individual variability in such characters as halter color and form of the accessory gland of the ejaculatory pump. When the latter structure is viewed from the side as in the illustrations, some individuals have the proximal accessory gland anterior to the distal and the positions are reversed in others. This suggested the specific name.

It is my feeling, based on the geographic range of the specimens at hand, that speciation is taking place and that

some time in the future several closely related but distinct species may evolve.

MALE. Head black; eyes dark red-brown above, black-brown below, extending over the back of the head and nearly touching for half the distance from the median ocellus to the antennal bases; frons narrow, triangular, with a median depression, striated below and smooth above; ocellar tubercle black-brown, shining; ocelli red-brown; back of the head concave; oral cavity bordered by a narrow band of white pubescence which extends dorsally as two bands to meet on the midline above the antennal bases; mouthparts brown, well developed; palpi black-brown, only half as long as mouthparts; antennae black-brown, the first two segments short, third segment oval and only twice as long as wide.

Thoracic dorsum black-brown, striated, with a silvery patch above the humeral callus; the transverse suture deeply grooved; humeral callus black-brown, sometimes with an orange tip, supraalar callus orange-brown; pleural areas black-brown; wings brownish hyaline in the northern part of the range to milky in the southern part, the veins brown to tan depending on wing color; halter stem brown, knob brown in northern range to red-brown southward, the ventral tip white in the northern specimens to the ventral half tan to cream southward, or the knob cream with a flush of brown over the basal half in the most south-westerly portion of the range; legs black-brown with brown tarsi, changing to red-brown with tan tarsi in the southern part of the range.

Abdomen black-brown to red-brown, rugose; segments 3 to 5 with broad white posterior margins, the anterior portion of the segment sclerotized, shining; terminalia as figured, 9th tergum truncate, aedeagal parameres short, 9th segment claspers pointed; internal ejaculatory organs nearly half again as long as 9th tergum. See figures for details.

FEMALE. Head black; eyes red-brown with a moderately wide, rounded, postocular rim; frons broad, narrowest just above the antennae, broadening dorsally, only slightly swollen on the lower portion, a shallow median depression with radiating striae on lower third; ocellar tubercle not prominent or set off from the frons, anterior ocellus sunken; ocelli red-brown; mouthparts and palpi as in the male; silvery pile bordering oral cavity extending to laterad of antennal bases; antennae as in the male.

Thorax as in the male except that light areas on ventral portion of halter knobs are diffused with red-brown.

Abdomen dark red-brown to red-brown; 8th sternum broadly truncate with median posterior margin gently convex; 9th sternum with a membranous margin and without prominent hairs; roof of bursa rectangular, membrane on ventrally projecting face. See figures for details.

LENGTH. Male body 2.7-3.0 mm., wing 1.9-2.3 mm.; female body 2.7-3.1 mm., wing 2.2-2.4 mm.

TYPE LOCALITY. Craters of the Moon National Monument, Idaho; 13 July 1965 (D. S. Horning) on Melalotus officinalis.

HOLOTYPE. Male, United States National Museum, no. 70818.

ALLOTYPE. Female, same data.

PARATYPES. 1 male and 1 female, same data as type except male 5 July 1965; 1 male, Las Cruces, New Mexico, 27 June

1961, (J. C. Watts) on alfalfa, 1 male, Phoenix, Arizona, 27 May 1938, (Christenson), 1 male, Lindsay, California, 15 July, (H. E. L.), all in United States National Museum; 1 male, Rifle, Colorado, 6 July 1901 (C. W. Johnson) in the Museum of Comparative Zoology, Harvard University; 3 males, Bishop, California, 28 July 1940, (D. E. Hardy), 1 male, Arivaca, Arizona, 26 July 1941, (R. H. Beamer); 1 female, Las Cruces, New Mexico, 3 July 1940, (R. H. Beamer), 1 female, Sabine, Arizona, 7 July 1950, (L. D. Beamer), all in Snow Museum; 1 female, Riverside, California, 1 October 1950, (Timberlake), 1 female, Sierra Madre Insectary, 20 October 1923, (Armitage) in Timberlake Collection; 1 female, Harrison Hot Springs, British Columbia, 16 August 1916, (C. G. Hewitt), in Canadian National Collection; 2 males, Patagonia, Arizona, 27 June 1961, (P. H. Johnson) ultra-violet light trap, 1 male, Continental, Arizona, 22 March 1956 (F. Werner, G. Butler) in swept alfalfa, 1 male, 8 miles North of Vail, Pima County, Arizona, 30 August 1962, (F. Werner, W. L. Nutting), ultra-violet light trap, 1 male, Litchfield Park, Arizona, 7 August 1956, (C. Williams) in swept alfalfa; 1 male, Cortaro, Arizona, 7 August 1957, (G. D. Butler) in swept mesquite, 1 female, Uma, Arizona, 18 June 1953, (Haga) on cotton, all in the University of Arizona; 1 male, Hat Creek P. O., Shasta County, California, 2 July 1965, (E. E. Lindquist), 1 male and 1 female, in copula 2 miles Northeast Rodeo, Hidalgo County, New Mexico, 24 July 1963, (A. Raske), in the University of California, (Berkeley).

GENUS BREVITRICHIA D. E. Hardy

The genus Brevitrichia containing 27 species is distributed west of the Rocky Mountains from Idaho and Washington to the north to Guatemala on the south. With the addition of the 15 new species described herein, the number of known species is raised to 42. The addition of so many new species has made it necessary to prepare completely revised keys to the genus Brevitrichia to be used in place of those found in Kelsey (1969) pp. 65-68.

Key To The Species Of Brevitrichia (Males)

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|--------|---|-------------------------------------|
| 1. | Wings hyaline | 2 |
| | Wings smoky white or brown | 9 |
| 2. (1) | Halter knob tan | 5 |
| | Halter knob cream or cream-yellow | 3 |
| 3. (2) | Halter knob cream, legs varicolored | 4 |
| | Halter knob cream-yellow, legs dark red-
brown with hind tibiae yellow-brown | |
| | <u>B. wilcoxi</u> Kelsey, new species | |
| 4. (3) | Legs with femora red-brown dusted with gray
pollen, tibiae orange-brown, tarsi orange-brown
darkening distally. | <u>B. arena</u> Kelsey, new species |
| | Legs with femora light brown with tan knees,
tibiae tan, tarsi tan, but darkening
distally | <u>B. arnaudi</u> Kelsey |

5. (2) Abdomen with black-brown or red-brown dorsal markings 6
 Abdomen white dorsally B. oculivirida Kelsey
6. (5) Abdomen with plain bands of color 7
 Abdomen with red-brown "T's" on first two segments, remainder cream dorsally
 B. badiclitella Kelsey, new species
7. (6) Bands dark-brown or red-brown with cream or tan membranes 8
 Bands black-brown with white membranes B. halli Kelsey
8. (7) Bands on abdomen red-brown with tan margins; antennae black-brown with tuft of white between tips B. albanota Kelsey, new species
 Bands on abdomen dark-brown with light posterior margins; antennae reddish-brown with two terminal spines, but no tuft of white between. B. ordwayi Kelsey
9. (11) Wings smoky-brown 10
 Wings smoky-white 12
10. (9) Halter knob tan and cream 11
 Halter knob tan B. hodgeni Kelsey
11. (10) Halter knob tan above, cream below. B. griffini Kelsey
 Halter knob tan with a creamy band separating upper and lower halves
 B. argentaurba Kelsey, new species
12. (9) Halter knob white 13
 Halter knob cream or tan dorsally 17
13. (12) Abdominal segments red-brown or black with white posterior membranes 14
 Abdomen pristine white or white with basal segment red-brown 15
14. (13) Abdominal segments black with white posterior margins B. insulana Cole
 Abdominal segments red-brown with white posterior margins B. inferacanna Kelsey, new species
15. (13) Abdomen pristine white above 16
 Abdomen with second segment with a red-brown base and a thick central stem, remainder of segment and abdomen white . . B. forficicruza Kelsey, new species
16. (15) R₄ branching from beyond r-m crossvein equal to length of r-m B. addacifons Kelsey
 R₄ branching from beyond r-m crossvein twice the length of r-m B. castanea Kelsey
17. (12) Halter knob tan 18
 Halter knob cream 23
18. (17) Abdomen predominantly white or marked with pigmented "T's" 19
 Abdominal segments red-brown with white posterior margins, halter knob cream below. B. yucantani Kelsey
19. (18) Abdomen marked with "T's" 20
 Abdomen without "T's", base of second segment red-brown, remainder white B. pruinosa Kelsey
20. (19) Halter knob all tan 21
 Halter knob tan above and below separated by a lateral band of white. B. nevada Kelsey, new species
21. (20) Abdomen marked with black-brown "T" on second segment, remainder essentially white 22

- Abdomen marked with red-brown "T's", with creamy lateral areas, over most abdominal segments B. griseola Coquillett
22. (21) Antennae with third segment light tan B. piscifonta Kelsey, new species
 Antennae with third segment orange-brown basally to red-brown distally B. miraloma Kelsey, new species
23. (17) Halter knob all cream 24
 Halter knob cream dorsally, white or yellow below or with tan band 29
24. (23) Abdomen white beyond large basal segment 25
 Abdomen banded with some color beyond large basal segment 26
25. (22) Basal segment of abdomen with anterior half red-brown continuing as a narrow longitudinal band to posterior margin in the form of a "T", lateral areas and rest of abdomen white B. boharti Kelsey
 Basal segment with anterior portion red-brown with a median wedge-shaped extension with a narrow stem meeting a broad lateral base giving a "wineglass" appearance, lateral areas and remainder of abdomen white B. daileyi Kelsey, new species
26. (24) Abdomen with a "T" on basal segment, narrow red-brown basal bands on some other segments; 9th tergum rounded at tip 27
 Abdominal segments all with red-brown bands with cream posterior membranes; 9th tergum pointed B. beameri Kelsey
27. (26) Abdomen with "T's" on basal segment only, bands on 3rd or 4th and remainder white excepting expanded 9th tergites 28
 Abdominal segments with median red-brown "T's" decreasing in size toward tip of abdomen, 9th tergum white with brown base B. coquilletti Kelsey
28. (27) 9th tergite white with a brown basal spot B. downeyi Kelsey
 9th tergite yellow with a tan basal spot B. davisii Kelsey
29. (23) Halter knob white or yellow below 30
 Halter knob with tan marginal band B. timberlakei Kelsey
30. (29) Halter knob yellow below 31
 Halter knob white below B. minuta Kelsey
31. (30) Abdominal segments yellow with black basal bands B. helenae James
 Abdominal segments brown with creamy membranous margins B. schlingeri Kelsey

Key To The Species of Brevitrichia (Females)

1. Wings hyaline 2
 Wings smoky-brown or white 12
2. (1) Halter knob tan, cream, or orange 3
 Halter knob white, 7 spines on 9th
 tergum B. flocki Kelsey
3. (2) Halter knob all or in part cream 4
 Halter knob all or in part tan or orange 10
4. (3) Halter knob all cream 5
 Halter knob cream above, tan below; 9th
 tergum with 7 spines B. downeyi Kelsey
5. (4) Abdomen brown or brown-red, orange, or
 orange-brown 6
 Abdomen brown grading to tan posteriorly 9
6. (5) Basal abdominal segments brown or red-brown 7
 Basal abdominal segments orange or orange-brown 8
7. (6) Basal abdominal segments brown with white
 posterior bands, 9th tergum with 7
 spines B. arnaudi Kelsey
 Basal two abdominal segments red-brown,
 granular on mid-portion, hind margins
 and lateral areas light orange, fourth
 segment red-brown basally, but distal
 portion and remainder of abdomen dark
 orange; 9th tergum with 7 orange spines
 B. septispina Kelsey, new species
8. (6) Abdominal segments 2-4 orange-brown with
 cream posterior margins, frosted; remainder
 red-brown shining; 9th tergum with 6 spines
 B. arena Kelsey, new species
 Basal abdominal segment orange with a median
 granular brown spot, other segments orange;
 9th tergum with 7 spines and a tuft of hair
9. (5) 9th tergum with 8 spines and a dorsal B. dicksoni Kelsey
 pit
 B. boharti Kelsey
 9th tergum with 6 spines B. schlinger Kelsey
10. (3) Halter knob all or in part tan 11
 Halter knob orange; 9th tergum with 8
 spines B. davis Kelsey
11. (10) Halter knob tan above, cream below; 9th
 tergum with 8 spines and a ventral pit
 B. beamer Kelsey
 Halter knob entirely tan; 9th tergum with
 9 short stiff spines B. halli Kelsey
12. (1) Wings smoky brown 13
 Wings smoky white 20
13. (12) Halter knob cream, cream-yellow or yellow 14
 Halter knob entirely tan, or tan above and
 lighter below 16
14. (13) Halter knob cream yellow or yellow; abdomen
 without "T's" 15
 Halter knob cream; abdomen with red-brown
 "T's", 9th tergum with 6 spines and much
 hair B. coquilletti Kelsey

15. (14) Halter knob cream-yellow; abdomen black-brown basally, lightening to orange-brown distally, all dusted with gray pollen; 9th tergum with 6 spines; post-ocular ridge divided on midline
 B. palmacana Kelsey, new species
 Halter knob yellow; lighter below; abdomen with basal segments red-brown with yellow posterior margins, remaining segments red-brown with orange lateral and posterior margins; 9th tergum with 6 black spines; hair on 8th and 9th segments directed anteriorly; postocular ridge continuous behind ocellar tubercle
 B. irwini Kelsey, new species
16. (13) Halter knob cream or white below 17
 Halter knob all tan; abdomen dark red-brown; 9th tergum with 1 dorsal spine and 7 pits B. hodgeni Kelsey
17. (16) Halter knob cream below 18
 Halter knob white below; 9th tergum with 7 spines B. griffini Kelsey
18. (17) Abdomen red-brown with white or cream 19
 Abdomen brown; 9th tergum with 8 spines
 B. melanderi Kelsey
19. (18) Abdomen red-brown, with white lateral patches, grading to all red-brown, 9th tergum with 4 spines B. yucatani Kelsey
 Abdomen red-brown with prominent paired dorsolateral longitudinal cream bands on segments 2-7; 9th tergum with 8 spines
 B. nayariti Kelsey, new species
20. (12) Halter knob white 21
 Halter knob yellow-brown, cream, or tan 22
21. (20) 9th tergum with 9 spines and a ventral tuft of hairs B. insulana Cole
 9th tergum with 7 spines and sparse hair B. palida Kelsey, new species
22. (20) Halter knob cream or tan 23
 Halter knob yellow-brown; 9th tergum without spines but with 8 pits B. aspinosa Kelsey
23. (22) Halter knob tan 24
 Halter knob wholly or partially cream 26
24. (23) Halter knob all tan 25
 Halter knob tan divided by a white band; abdomen red-brown dusted with gray pollen; 8th segment orange, 9th tergum with 8 orange spines B. nevada Kelsey, new species
25. (24) Abdomen red-brown; 9th tergum with 5 spines and much anteriorly directed hair . B. ordwayi Kelsey
 Abdomen red-brown; 9th tergum with 8 light orange spines. The dorsal 4 shorter than the ventral 4 B. piscifonta Kelsey, new species
26. (23) Halter knob entirely cream 28
 Halter knob cream with tan lateral bands 27

- 27. (26) Abdomen brown with white lateral patches;
 9th tergum with hair only, no pits
 B. addacifons Kelsey
 Abdomen with red-brown "T's" becoming
 yellow-brown apically, 9th tergum
 with 6 spines B. timberlakei Kelsey
- 28. (26) Abdomen brown grading to tan apically;
 9th tergum with a fringe of hairs only
 B. minuta Kelsey
 Abdomen cream with red-brown central "T's"
 grading to orange apically; 9th tergum
 with 7 spines and very short hair . . B. kerni Kelsey
 Abdomen black with white posterior
 segmental bands; 9th tergum with 8
 spines B. griseola Coquillett
 Abdomen red-brown with white posterior
 segmental bands; 9th tergum with 6
 spines B. scitulacea Kelsey

Brevitrichia albanota Kelsey, new species.
 (Figure 10.)

MALE. Head creamy white; eyes red-brown with a metallic green sheen, darker below; frons narrow, slightly swollen, and with an inverted V-shaped black-brown cleft above the antennae; ocellar tubercle black-brown, pollinose; ocelli red-brown; mouthparts well developed, but filling only half of the oral cavity; palpi black-brown, nearly as long as rostrum; antennae black-brown, second segment short with tan distal membrane, third segment pear-shaped, scaled, and with a tuft of white in cleft tip. It is from the latter character that the species derives its name; see figures for details.

Thorax dorsum black-brown, dusted with gray pollen and with two olivaceous mediolateral bands; lateral portions of notum black-brown to olivaceous gray depending on how light strikes; humeral callus cream at tip; scutellum black-brown, dusted with gray pollen; pleural areas black-brown, dusted with gray pollen; wings hyaline with dark brown veins; halter stem brown; knob light tan above and cream below; legs black-brown and pollinose, with knees of femora tan.

Abdomen granular, red-brown, with thin, tan, membranous margins; terminalia granular, red-brown basally and tan distally, with sparse hair; aedeagal parameres long; see figures for details.

FEMALE. Unknown.

LENGTH. Male body 2.9 mm., wing 2.0 mm.

TYPE LOCALITY. Six miles SE. of Parker, Arizona, 13 April 1965, (M. E. Erwin) (Sand dune association).

TYPE DEPOSITED. California Academy of Sciences, no. 10103 (ex University of California, Riverside).

Brevitrichia arena, Kelsey, new species.

(Figure 11.)

MALE. Head light brown; eyes extending to back of the head, red-brown with a green metallic sheen and darker below; frons very narrow, triangular, and with a darker central triangle above the antenna which causes frons to have a V-shaped appearance; ocellar tubercle black-brown, dusted with tan pollen; ocelli red-brown; oral cavity deeply sunken; mouthparts with rostrum black-brown, labellum brown, palpi short and brown; antennae with first two segments black-brown, third segment red-brown, pear-shaped and with two distal points; see figures for details.

Thorax dorsum black-brown dusted with bands of gray, olive, and black-brown pollen in patterns that vary with position from which viewed; lower edges of dorsum cream yellow; humeral and supraalar calli cream yellow; scutellum largely black-brown with cream yellow lateral areas, all dusted with gray pollen; propleuron cream yellow; mesanepisternum largely red-brown and dusted with gray pollen; mesokatepisternum red-brown with dorsal area cream and dusted with gray pollen; wings clear with tan to opaque veins; halter stem brown, knob cream yellow; legs with femora red-brown and dusted with gray pollen, tibiae orange-brown, tarsi orange-brown, darkening distally.

Abdomen red-brown with cream posterior membranes; segments 2 to 5 dusted with gray pollen; 9th tergum narrow and with black-brown base, remainder frosted whitish; see figures for details.

FEMALE. Head orange-brown; eyes red-brown with a metallic green sheen; postocular ridges moderately broad, extending uninterruptedly behind the ocellar tubercle; a dark brown patch behind the dorsal angle of each eye; frons broad, frosted, with scattered light hairs and cut off from the postocular ridges by grooves that extend from the upper corner of each eye to a lateral ocellus; ocellar tubercle black-brown with olive pollen; ocelli red-brown; oral cavity sunken; mouthparts with rostrum red-brown, labellum brown, palpi short, orange-brown; antennae red-brown, third segment pear-shaped, ending in two points with a median peg and covered with short hairs with golden sheen; see figures for details.

Thorax dorsum orange-brown with anteromesal and posterolateral dark black-brown bands of pollen, but yellow above humeral callus and on sides back to scutellum; humeral and supraalar calli cream; scutellum with a narrow median band of red-brown bordered by orange and with yellow margins; propleuron mesanepisternum yellow with a ventral red-brown spot; mesakatepisternum red-brown with a broad dorsal yellow band and dusted with gray pollen; wings hyaline with brown veins; halter stem brown, knob cream-yellow; legs frosted orange-brown.

Abdominal segments 2 to 4 red-brown with cream posterior margins and frosted with gray pollen; segments 5 to 7 red-brown, shining; 8th segment orange-brown; 9th tergum with six black spines and dark hairs; see figures for details.

LENGTH. Male body 2.6 mm., wing 1.8 mm; female body 4 mm., wing 2.0 mm.

TYPE LOCALITY. One mile W. of Glamis, Imperial County, California, 1 October 1965, (M. E. Irwin) (Sand dune

association).

TYPE. Male and allotype female on same pin deposited in California Academy of Sciences, no. 10104 (ex University of California, Riverside).

Brevitrichia argentaurba Kelsey, new species.
(Figure 12.)

MALE. Head tan; eyes dark red-brown above, with a green metallic sheen, lower facets black-brown with a violet sheen and occupying most of the head in side view; frons narrow triangular, slightly swollen; genae cream; back of head brown; ocellar tubercle red-brown, dusted with olive pollen; ocelli red; oral cavity large, sunken, mouthparts filling two-thirds of the oral opening, rostrum red-brown, labellum creamy, palpi brown, half as long as mouthparts; antenna dark red-brown, first two segments short, third pear-shaped and ending in two points without a central peg; see figures for details.

Thorax black dusted with bands of brown and tan pollen which change pattern when viewed from different angles; lower half of humeral callus cream; mesoscutellum black-brown, dusted with brown pollen, but lower posterior edges tan; propleura tan; mesopleurum generally black-brown and dusted with brown pollen, very little light area; wing brownish hyaline with brown veins; halter stem brown, knob tan with a creamy band separating upper and lower halves; legs black-brown, dusted with brown pollen, but knees of femora tan.

Abdominal segments brown and dusted with brown pollen, except intersegmental membranes narrowly whitish, 9th tergum with base brown, dusted with brown pollen, remainder creamy; 10th segment distinctly visible and covered with long hairs; aedeagal bristle short; see figures for details.

FEMALE. Unknown.

LENGTH. Male body 3 mm., wings 2 mm.

TYPE LOCALITY. One mile S. of Sliver City, Grant County, New Mexico, 1 June 1965, (M. E. Irwin).

TYPE DEPOSITED. California Academy of Sciences, no. 10105, (ex University of California, Riverside).

Brevitrichia badiclitella Kelsey, new species.
(Figure 13.)

This species is named after the red-brown saddle-like markings on the dorsum of the thorax.

MALE. Head tan; eyes a metallic blue-green with large upper and finer lower facets; frons narrow, triangular, swollen, with a median cleft and darker dorsally; ocellar tubercle black-brown with a dusting of brown pollen; ocelli black; mouthparts well developed, with rostrum red-brown, labellum tan; palpi tan; antennae brown, first segment nearly twice as long as second; third antennal segment long, pear-shaped, cleft at tip and pubescent; see figures for details.

Thorax dorsum with a solid red-brown, saddle-like area surrounded by areas of yellow above the humeral callus, lateral margins, and on either side of the midline of the posterior scutum; all covered with a fine dusting of gray pollen; humeral and supraalar calli cream; scutellum with a large red-brown median spot and bordered by yellow and cream laterally; propleuron cream; mesanepisternum cream with a red-brown spot; mesokatepisternum red-brown with a cream dorsal margin; wings hyaline with brown veins; halter stem brown, knob tan with a brown dividing line; legs red-brown except femora with white knees.

Abdomen with second segment with a red-brown "T" which has a broad base and a stem that does not attain posterior margin, rest of tergum cream, except lateral margins red-brown; third segment with smaller red-brown "T", remainder of abdomen cream dorsally; 9th segment tan with a dark basal spot and covered with long hairs; aedeagal spines long; see figures for details.

FEMALE. Unknown.

LENGTH. Male body 2.7 mm., wings 1.8 mm.

TYPE LOCALITY. Temecula, Riverside County, California, 25 June 1963 (E. I. Schlinger).

HOLOTYPE DEPOSITED. California Academy of Sciences, no. 10106 (ex University of California, Riverside).

Brevitrichia daileyi Kelsey, new species.
(Figure 14.)

MALE. Head cream; eyes red-brown above and black-brown below, a very narrow postocular ridge just laterad of the ocellar tubercle; frons narrow, triangular, and with a small triangular area in front of the ocellar tubercle; ocellar tubercle black, granular; ocelli red-orange; mouthparts orange, two thirds as long as the oral cavity; palpi orange, half as long as the oral cavity; antennae with first segment short and red-brown, second and third segments orange; third segment pear-shaped and ending in two points; see figures for details.

Thorax dorsum yellow with a dark red-brown median band extending two thirds the distance to the scutellar sulcus and on each side of this a red-brown lateral stripe extending from the humeral callus to short of the scutellar sulcus, all dusted with gray pollen; humeral and supraalar calli cream; propleuron cream yellow, mesanepisternum cream yellow with a red-brown basal spot, mesokatepisternum red-brown with a dorsal yellow band and all dusted with gray pollen; wings milky white with pale tan veins; halter stem brown, knob cream; fore legs with coxae cream and remainder yellow-brown; middle legs with coxae cream and remainder orange-brown with tarsi darkening at tip; hind legs with coxae cream, femora red-brown, tibiae orange-brown and tarsi orange-brown, darkening distally.

Abdomen with segments 1-8 white, second and third segments marked with red-brown, wine-glass shaped marks on dorsal surface; 9th tergite with base brown and the remainder cream; see figures for details of terminalia.

FEMALE. Unknown.

LENGTH. Male body 3.1 mm., wing 2.2 mm.

TYPE LOCALITY. Kennewick, Washington, (7 miles SW.), grass beside irrigation ditch, 17 July 1957 (E. F. Dailey).

TYPE DEPOSITED. Washington State University, Pullman, Washington, no. 328.

Brevitrichia forficicruxa Kelsey, new species.
(Figure 15.)

MALE. Head cream; eyes red-brown above, black-brown below, and may have metallic glints when fresh; frons narrow, triangular, depressed on lower midline; ocellar tubercle black-brown, dusted with gray pollen; ocelli black-brown; oral cavity deeply sunken, with mouthparts filling opening; rostrum brown, labellum tan, palpi tan and only as long as rostrum; antennae red-brown (third segment missing).

Thorax dorsum black-brown dusted with bands of gray and olive pollen and with an orange patch above and behind humeral calli; humeral calli with ventral surface orange and a red-brown dorsal band; supraalar calli orange; scutellum with a large red-brown median spot and orange lateral angles; propleuron orange, mesanepisternum orange with a ventral band of red-brown, mesokatepisternum red-brown with a narrow dorsal orange band, all dusted with gray pollen; wings milky hyaline with tan veins; halter stem brown, knob white with a tan-brown dorsal rib; legs red-brown dusted with gray pollen, except knees of femora which are orange-yellow.

Abdominal second segment with anterior margin and thick central stem red-brown, lateral areas and posterior margins white, and remaining segments except 9th white dorsally with lateral margins red-brown; 9th tergum with the base red-brown, white laterally, and all dusted with gray pollen; see figures for details.

FEMALE. Unknown.

LENGTH. Male body 2.3 mm., wing 2 mm.

TYPE LOCALITY. Scissors Crossing, San Diego County, California, 26 June 1958 (R. M. Bohart).

TYPE DEPOSITED. California Academy of Sciences, no. 10107 (ex University of California, Riverside).

Brevitrichia inferacanna Kelsey, new species.
(Figure 16.)

MALE. Head cream; eyes red-brown above, black-brown below, and with a narrow postocular rim; frons small, triangular, with an inverted "V" groove in the swollen portion above the antennae, and covered with granular pollen; ocellar tubercle black-brown and covered with gray pollen; ocelli red-brown; antennae with basal segments tan, third segment red-brown, pear-shaped, and granular; see figures for details.

Thorax dorsum black-brown, covered with gray pollen, and with a white lateral band extending to the scutellum from above and including the humeral and supraalar calli; scutellum with

the lateral margins and base white, midportion with a red-brown patch that tapers to a point on the posterior midline, all covered with gray pollen; mesanepisternum white with a red-brown ventral spot, mesokatepisternum red-brown with a white dorsal band, all dusted with gray pollen; wings milky white with tan veins; halter stem brown, knob white; legs red-brown and dusted with gray pollen, except knees of femora which are white.

Abdomen red-brown with white posterior bands on all segments, except 9th tergum white with a proximal ventral red-brown spot, all dusted with gray pollen; aedeagal prongs short, straight, not exceeding the 9th tergum. The terminalia were lost on dissection, so could not be illustrated but similar to those of *B. minuta* Kelsey 1969, figure 132.

FEMALE. Unknown.

LENGTH. Male body 2.3 mm., wing 1.6 mm.

TYPE LOCALITY. Deep Canyon, Riverside County, California, 23 August 1963 (E. I. Schlinger).

TYPE DEPOSITED. California Academy of Sciences, no. 10108 (ex University of California, Riverside).

Brevitrichia irwini Kelsey, new species.
(Figure 17.)

FEMALE. Head cream; eyes red-brown with a moderately broad postocular ridge continuing uninterrupted behind the ocellar tubercle and a dark spot behind the eyes extending mesad toward the median ocellus past the eye margin along the front; frons broad, tan except for a narrow cream band next to each eye, and with a shallow groove extending two thirds of the distance from the median ocellus to the antennal bases; ocellar tubercle red-brown, covered with tan pollen; antennae with first segment red-brown, second segment orange and shorter than first, third segment red-brown, pear-shaped, ending in two points; all segments dusted with pollen; see figures for details.

Thorax dorsum orange with a broad brown median band on anterior two thirds bordered by narrow lateral bands on posterior two thirds, all dusted with pollen; anterolateral portions of dorsum with moderately long, light hairs; humeral and supralar calli cream; mesoscutellum orange with only a small brown spot at the mid-dorsal base; propleuron cream and orange, mesanepisternum orange with dark red-brown ventral spot, mesokatepisternum red-brown with a dorsal band of orange, all dusted with pollen; wings brownish hyaline with brown veins; halter stem tan, knob yellow, but lighter below; legs light brown and dusted with pollen, except tips of tibiae red-brown and darker.

Abdominal second and third segments mostly red-brown, each having yellow posterior band and lateral margins, remaining segments red-brown with orange lateral and posterior margins, all subshining. Terminalia red-brown, 9th tergum with 6 black spines and a tuft of hairs, additional hairs anteriorly directed, as also are the hairs of 8th segment; see figures for details.

MALE. Unknown.

LENGTH. Female body 4.2 mm., wing 2.1 mm.

TYPE LOCALITY. One mile W. of Glamis, Imperial County, California, 28 January 1965 (M. E. Irwin). Sand dune association rearing no. 65-1-28 Bj. with larval and pupal skins.

TYPE DEPOSITED. California Academy of Sciences, no. 10109 (ex University of California, Riverside).

Brevitrichia miraloma Kelsey, new species.
(Figure 18.)

MALE. Head creamy white; eyes red-brown above, black-brown below, extending to the back of the head and separating the frons from the ocellar tubercle; frons small, triangular, extending two-fifths of the distance from antennae to median ocellus; ocellar tubercle black-brown, dusted with gray pollen; ocelli red-brown; back of head with central portion black-brown and lateral portions creamy white; oral cavity creamy white; mouthparts, filling oral cavity, light brown, but palpi tan; antennae with first two segments short and brown; third antennal segment orange-brown basally, red-brown distally, pear-shaped, and ending in two sharp points with a median peg between; see figures for details.

Thorax dorsum generally black-brown and dusted with tan pollen, area above humeral callus cream to orange, as are also the lateral areas of the scutum, a black-brown spot on the posterior midline of the scutum preceded by a square of, and bounded by lateral bands of, orange; humeral callus cream with the dorsal margin black-brown, supraalar callus cream; meso-scutellum cream to orange with a spot of black-brown occupying the central fifth; propleuron creamy, mesanepisternum with base black-brown and dorsal rim cream, mesokatepisternum with base black-brown and dorsal area cream-orange, all covered with pollen; wings smoky white with tan veins; halter stem brown, knob tan; legs with coxae cream, femora red-brown dusted with tan pollen, and tibiae and tarsi brown.

Abdominal segments essentially white with black-brown markings along midline except second and 9th segments, second segment marked with a black-brown "T" with broad anterior, central stem, and posterolateral extensions, remainder of segment white; 9th tergum white with a dark brown basal spot; all segments dusted with tan pollen; see figures for details.

FEMALE. Unknown.

LENGTH. Male body 2.75 mm., wing 2.25 mm.

TYPE LOCALITY. One mile N. of Mira Loma, Riverside County, California, 30 July 1967 (M. E. Irwin), sand dune association.

HOLOTYPE DEPOSITED. California Academy of Sciences, no. 10642 (ex University of California, Riverside).

Brevitrichia nayariti Kelsey, new species.
(Figure 19.)

FEMALE. Head light tan; eyes black-brown; postocular area

limited; brown area behind the eyes broad; groove from corner of eye to ocellar triangle not attaining the back of the head, so the two sides meet narrowly behind the ocellar tubercle; frons broad, half again as wide as ocellar tubercle, cleft by a median groove, and with a band of light brown extending from ocellar tubercle to antennae; this band broadens anteriorly and has a few sparse hairs along the margins; ocellar tubercle black-brown and dusted with brown pollen; ocelli amber; rostrum light brown, labellum tan, palpi tan and short, only as long as rostrum; antennae with first two segments brown, but third segment orange-brown, pear-shaped, and forked at tip; see figures for details.

Thorax dorsum dark brown, heavily crusted with brown and tan pollen, but orange above humeral callus and on either side of posterior portion of scutum; humeral and supraalar calli cream; scutellum tan with a relatively narrow median band of red-brown; propleuron cream, mesanepisternum red-brown with a dorsal band of tan, mesokatepisternum with ventral portion red-brown and dorsal area orange, all dusted with tan pollen; wing tinged brown with brown veins; r-m more distant from R_4 than usual for the genus; halter stem tan, knob light tan above, and cream below; legs light brown, dusted with pollen which makes femora look lighter along the midline, first tarsal segment lighter.

Abdomen red-brown with prominent paired dorsolateral longitudinal cream bands on segments 2 to 7 and sternum cream along mid portion; 8th segment red-brown, subshining, and sparsely haired, 9th tergum with 8 spines; all dusted with pollen; see figures for details.

MALE. Unknown

LENGTH. Female body 3.7 mm., wing 1.9 mm.

TYPE LOCALITY. Ten miles N. of Tuxtlan del Rio, Nayarit, Mexico, 28 April 1961 (Howden & Martin).

TYPE DEPOSITED. Canadian National Collection, no. 11429.

Brevitrichia nevada Kelsey, new species.

(Figure 20.)

MALE. Head cream; eyes light red-brown above, darker below, and extending to back of head; frons narrow, triangular; ocellar tubercle black-brown, dusted with tan pollen; ocelli red-orange; mouthparts well developed and filling the oral cavity, brown, except palpi tan and half as long as mouthparts; antennae with first segment brown and short, second segment brown basally and orange-brown distally, third segment brown, pear-shaped, and with two distinct points; all covered with gray pollen.

Thorax with dorsum black-brown, dusted with brown and olive pollen; notum with a crescent of orange-brown laterad of the midline on the posterior portion and orange marginal areas; humeral and supraalar areas cream; mesoscutellum with dorsal portion black-brown, dusted with gray pollen, lateral margins and ventral portion cream; propleuron orange, mesanepisternum

largely black-brown with a thin orange dorsal band, mesokatepisternum black-brown below and orange above, all dusted with gray pollen; wings milky hyaline with tan veins; halter stem brown, knob tan with lateral margin white; legs red-brown, with orange-brown femoro-tibial knees, and dusted with gray pollen.

Abdominal second segment with anterior and median portion dark black-brown in the form of a "T" that does not attain the posterior margin, remainder of segment and succeeding segments, except 9th, white except lateral margins of tergites black-brown, all dusted with gray pollen; 9th tergum with base and dorsal portion black-brown, dusted with gray pollen, lower margins creamy white; see figures for details.

FEMALE. Head cream; eyes red-brown, with a narrow post-ocular ridge set off from the frons by sulci which extend from the upper corner of the eye curving to the center of the lateral ocelli; the two sides of the head joining uninterruptedly behind the ocellar tubercle, a brown spot lateral to the upper corner of the eye extending toward back of the head, frons nearly twice as wide as the ocellar tubercle and divided on the midline by a shallow groove which is bordered by a brown area that widens anteriorly from lateral of the median ocellus to above, but not attaining the antennal socket, dusted with gray pollen; ocellar tubercle black-brown, dusted with gray pollen; ocelli red-orange; mouthparts and antennae as in the male; see figures for details.

Thorax as in the male except wings smoky brown hyaline with brown veins.

Abdomen mostly red-brown with creamy membranes at the posterior margins of segments, all dusted with gray pollen; 8th segment orange-brown; 9th tergum with 8 orange spines; see figures for details.

LENGTH. Male body 2.8 mm., wing 2.1 mm., Female body 3.7 mm., wing 2.2 mm.

TYPE LOCALITY. South end of Topaz Lake, Douglas County, Nevada, 5,000 feet, 20 July 1967 (M. E. Irwin).

TYPES DEPOSITED. Holotype male and allotype female (on same pin) in California Academy of Sciences, no. 10643 (ex University of California, Riverside).

Brevitrichia palida Kelsey, new species.
(Figure 21.)

FEMALE. Head cream; eyes pale (brown?, specimen may be teneral); postocular ridge cut off from frons by a groove from the upper corner of the eye to behind the lateral ocellus and continuing uninterruptedly behind the ocellar tubercle, marked with red-brown behind the eyes; frons broad, with a median groove from the antennae to the median ocellus, bordered by a broad band of tan the width of the ocellar tubercle; ocellar tubercle black-brown and granular; mouthparts cream, well developed, and filling the oral cavity, but palpi white and only half as long as mouthparts; antennae with first two segments cream, third segment orange, pear-shaped, forked at tip, and with a median peg between the forks; see figures for details.

Thorax dorsum with a median longitudinal black-brown band on anterior three-fourths bordered by orange bands on either side which become joined posteriorly and two lateral black-brown bands extending from over the humeral calli to over the supraalar calli, lateral margins cream, humeral callus white, and supraalar callus cream; mesocutellum cream, with a narrow black-brown median band which extends for a short distance across the scutoscuteellar sulcus, all dusted with gray pollen; mesanepisternum cream with a red-brown patch, mesokatepisternum red-brown with a cream dorsal border, all dusted with gray pollen; wings milky white with creamy to white veins; halter stem cream, knob white; legs with femora orange-brown, tibiae cream, and tarsi cream basally, darkening to brown distally.

Abdominal segments 2 to 4 orange-brown with mid-lateral white areas, remainder of abdomen orange-brown, 8th segment elongate, 9th tergum with 7 spines and sparse hair; see figures for details.

MALE. Unknown.

LENGTH. Female body 3.3 mm., wing 2.3 mm.

TYPE LOCALITY. Twelve miles S. of Bakersfield, Kern County, California, 6 August 1958 (E. I. Schlinger). Collected by vacuum cleaner in alfalfa field.

TYPE DEPOSITED. California Academy of Sciences, no. 10110 (ex University of California, Riverside).

Brevitrichia palmacana Kelsey, new species.
(Figure 22.)

FEMALE. Head cream; eyes red-brown; postocular ridge moderately broad, separated from the frons by sulci from the upper corners of the eyes to the back of the ocellar tubercle, the two sides divided by a median sulcus at the back of the head; a tan spot behind eyes extending upward from the back of the head, but not attaining the eye margin; frons broad, half again as wide as the ocellar tubercle, a tan band the width of the ocellar tubercle extending from the latter to the antennal bases, divided on the midline by a shallow groove; back of head black-brown, dusted with gray pollen; mouthparts extending two-thirds the length of the oral cavity, light brown, but palpi cream and only half as long as the mouthparts; antennae with two basal segments red-brown, the third a lighter red-brown, dusted with gray pollen, pear-shaped, and ending in two points with a median peg between; see figures for details.

Thorax with pronotum yellow; mesonotum striped with three longitudinal black-brown bands, median band broad narrowing on the posterior fourth and continuing to posterior margin of the scutellum, lateral bands separated from the median band and scutellar margin by orange areas, all dusted with gray pollen; humeral and supraalar calli cream; pleural areas largely light orange with lower two-thirds of mesoan- and mesokatepisterna red-brown and dusted with gray pollen; wings brownish hyaline with brown veins; halter stem light red-brown and dusted with gray pollen, knob cream-yellow; legs with femora red-brown and dusted with gray pollen, tibiae light brown basally, but

darkening distally, and tarsi red-brown, but lighter at base.

Abdomen black-brown basally, lightening to orange-brown distally and dusted with gray pollen; 8th segment orange-brown; 9th tergum with 6 black spines; see figures for details.

MALE. Unknown.

LENGTH. Female body 4.5 mm., wing 2.5 mm.

TYPE LOCALITY. At mouth of Palm Canyon, 25 miles S. of Quartzite, Arizona, 31 March 1968 (M. E. Irwin).

TYPE DEPOSITED. California Academy of Sciences, no. 10644 (ex University of California, Riverside).

Brevitrichia piscifonta Kelsey, new species.
{Figure 23.}

MALE. Head white except black at back center; eyes red-brown with fine upper and coarser lower facets; frons short, triangular and unmarked; ocellar tubercle black-brown and dusted with gray pollen; ocelli orange-brown; mouthparts short, filling only half of the oral cavity, light tan, with palpi light tan and shorter than rostrum; antennae light tan with third segment pear-shaped and bifurcated at tip; see figures for details.

Thorax with dorsal portion of scutum black-brown, dusted with bands of gray and olive pollen, and with lateral margins, area above humeral callus, and two arcs laterad of the midline anterior to the scutellum, orange; humeral callus white, except for a dash of red-brown along the dorsal margin; supraalar callus white; scutellum with a large central black-brown spot and lateral and ventral portions creamy; propleuron creamy with red-brown areas, mesanepisternum orange-yellow with a black-brown ventral spot; mesokatepisternum black-brown with a creamy dorsal margin; all pleural areas dusted with gray pollen; wings smoky white with tan veins; halter stem brown and knob tan; legs yellow-brown, with each segment a darker brown distally.

Abdominal second segment with a thick black-brown, central-stemmed "T", remainder white, segments 3 to 7 white with lateral margins black-brown; 9th tergum with base red-brown, remainder white; aedeagal spines short; see figures for details.

FEMALE. Head creamy white; eyes red-brown with a moderately wide postocular area which continues uninterruptedly behind the ocellar tubercle, a black mark laterad of the upper hind corner of the eye; frons broad, with a central band of red-brown, strongly cleft on the midline, and with a few scattered red-brown hairs; ocellar tubercle black-brown, frosted with gray pollen; ocelli red-brown; mouthparts and antennae as in the male; see figures for details.

Thorax dorsum with three areas of black-brown separated by bands of orange, mesal band extending two-thirds the distance to the scutellum, flanked by two lateral areas extending from behind the humeral callus to near the scutosculellar sulcus, lateral margins orange; scutellum with a dark red-brown patch covering middle third and continuing anteriorly across scuto-scutellar sulcus as a thin band on the midline; lateral areas of scutellum orange, and entire dorsum dusted with gray and

olive pollen; humeral and supraalar calli cream-white; propleuron cream-white, mesanepisternum orange above and with a red-brown spot below, mesokatepisternum red-brown with an orange dorsal band, all dusted with gray pollen; wings milky white hyaline with tan veins; halter stem brown, and knob tan; legs brown.

Abdomen red-brown with tan margins; terminalia orange-brown; 9th tergum with 8 light orange spines, the 4 dorsal ones shorter than the ventral 4, and with some short hair. Accessory gland in the figures milky white; see figures for details.

LENGTH. Male body 2.7 mm., wing 2 mm. female body 2.8 mm., wing 1.8 mm.

TYPE LOCALITY. Fish Springs, Imperial County, California, 13 September 1965 (R. C. Dickson) Yellow sticky trap.

TYPES DEPOSITED. Holotype male and allotype female (same data as the male), in California Academy of Sciences, no. 10111 (ex University of California, Riverside).

Brevitrichia septispina Kelsey, new species.
(Figure 24.)

FEMALE. Head yellow-orange; eyes black-brown with red metallic glints; postocular ridge moderate, not separated by ocellar tubercle or sulci; brown spots laterad of the dorsal corner of the eyes small, not attaining posterior margin of ridge; frons broad, with an orange-brown patch on center as wide above and wider below than the ocellar tubercle; ocellar tubercle black and granular; ocelli orange; mouthparts with rostrum black-brown, labellum cream, and palpi dirty white, but brownish at tips; antenna with first segment red-brown, second orange and twice as long as first, third pear-shaped and red-brown, but lighter at base; see figures for details.

Thorax dorsum with a black-brown band along the midline on anterior three-fourths, separated from similar lateral bands extending along the posterolateral three-fourths by a thin band of orange which extends from an orange area above the humeral callus to an orange area laterad of the midline on the posterior fourth, lateral margins orange and all dusted with gray and olive pollen; humeral and supraalar calli cream, mesocutellum orange, with a median red-brown patch covering top third and extending across scutoscuteellar sulcus as a thin band on the midline, all dusted with pollen; propleuron cream, mesanepisternum orange with a red-brown basal patch and mesokatepisternum red-brown with an orange dorsal band; wings hyaline with brown veins; halter stem brown and knob cream; legs with fore and middle coxae and trochanters orange, hind coxae and trochanters brown, femora red-brown, tibiae orange with distal end red-brown, all pollinose, and tarsi with proximal portion of first segment orange, but distal portion and remainder red-brown.

Abdominal second and third segments mostly red-brown, granular on midportion, but hind margins and lateral areas light orange; fourth segment red-brown basally and dark orange distally; remaining segments dark orange; except terminalia light

red-brown, 9th tergum with 7 orange spines and black-brown hairs; see figures for details.

MALE. Unknown.

LENGTH. Female body 4.5 mm., wing 2.4 mm.

TYPE LOCALITY. Eighteen miles W. of Blythe, Riverside County, California, 2 April 1963 (M. E. Irwin).

TYPE DEPOSITED. California Academy of Sciences, no. 10112 (ex University of California, Riverside).

Brevitrichia wilcoxi Kelsey, new species.
(Figure 25.)

MALE. Head brown with genae orange-brown; eyes red-brown with green metallic glints; lower one-fourth of eye, when viewed from side, darker, because of finer facets; frons small, triangular, and depressed on midline; ocellar tubercle red-brown; mouthparts with rostrum and labellum brown-orange, palpi tan, short, and half the length of rostrum; antennae red-brown, third segment swollen at base, forked at tip, and with median peg subequal to lateral prongs; see figures for details.

Thorax mostly black, covered by dark and light stripes of pollen; humeral and supraalar calli cream with an orange spot behind humeral callus; scutellum black, dusted with gray pollen, and with lateral angles orange-brown; pleurum generally black, dusted with light gray pollen, but with a few light areas; wings hyaline with brown veins; halter stem red-brown and knob cream-yellow; legs dark red-brown, dusted with gray pollen, but hind tibiae yellow-brown.

Abdomen with all segments red-brown, dusted with gray pollen, and with posterior membranes narrow, whitish; 9th tergum red-brown basally, distal portion creamy white with long white hairs; aedeagal bristles very long; see figures for details.

FEMALE. Unknown.

LENGTH. Male body 3.8 mm., wing 2.2 mm.

TYPE LOCALITY. Eighteen miles S. of Gila Bend, Arizona, 12 May 1965, (J. Wilcox).

TYPE DEPOSITED. California Academy of Sciences, no. 10113 (ex University of California, Riverside).

GENUS PSEUDATRICHIA OSTEN SACKEN

The genus Pseudatrichia, containing 33 described species, has a range from south central British Columbia through Central America to Brazil. To date no species have been recorded east of the Rocky Mountain chain. Two of the species reported here represent the most easterly and northeasterly examples of North American distribution of the genus. The three new species described below raise the number of known Pseudatrichia species to 36.

The following changes in the key to the species of Pseudatrichia in Kelsey (1969, Pg. 223) will permit their separation.

Key to the species of Pseudatrichia (Males)

10. (8) Antennae orange-brown 10a
 Antennae black-brown P. unicolor Coquillett
 10a(10) Seventh abdominal segment elongate,
 red-brown; 9th segment black-
 brown P. rufitruncula Kelsey, new species
 Seventh abdominal segment short, shining,
 black; 9th segment black. . . P. gracilipennis Kelsey

Key to the species of Pseudatrichia (Females)

5. (4) Abdomen with 8th segment long and narrow 5a
 Abdomen with 8th segment only slightly
 longer than wide, marked with black
 areas dorsally and ventrally (Mexico). P. longurio Loew
 5a. (5) Median emargination of sternum
 pointed (Costa Rica) P. longiventris Kelsey
 Median emargination of sternum gently
 rounded (Mexico and Texas).
 P. rufitruncula Kelsey, new species
 16. (13) Eighth sternum gently rounded on
 posterior margin 16a
 Eighth sternum notched on posterior
 midline P. evergreeni Kelsey
 16a(16) Vein R_4 arising from middle of cell,
 undulating to attain wing margin
 beyond tip of cell R_5 P. unicolor Coquillett
 Vein R_4 arising from distal third cell
 and reaching wing margin before tip of
 cell R_5 ; cell R_5 pointed
 P. schlingeri Kelsey, new species
 20. (19) Vein R_4 ending in wing margin opposite
 tip of cell R_5 20a
 Vein R_4 ending in wing margin well
 beyond tip of cell R_5 P. barnesi Kelsey
 20a(20) Vein M_{1+2} joining vein R_5 at nearly a
 right angle, making cell R_5 blunt; 9th
 sternum trilobed. . P. idahoensis Kelsey, new species
 Vein M_{1+2} joining R_5 more gradually,
 cell R_5 more pointed; 9th sternum
 excavated on the midline P. bakeri Kelsey

Pseudatrichia idahoensis Kelsey, new species.
 (Figure 26.)

FEMALE. Head black; eyes black-brown; postocular ridges prominent, the two ridges separated by the ocellar tubercle;

frons moderately broad, not wider than ocellar tubercle, roundly swollen above the antennal bases and with a faint median groove on the upper half; ocellar tubercle black, set off; ocelli red; back of head pollinose; mouthparts brown, filling oral cavity, palpi brown, half as long as rostrum; silvery pile bordering oral cavity; antennae with basal segments black-brown and short; third segment black-brown at base, orange-brown elongate and truncated at tip; see figures for details.

Thorax black, rugose, transversely striated, and with a pilose area above humeral callus; humeral and supraalar calli orange-brown; pleural areas black; wings hyaline with black-brown veins; vein M_{1+2} joins R_5 at a right angle; halter stem brown and knob white with a brown base and dorsal rib; fore legs orange, middle legs orange-brown, and hind legs red-brown.

Abdomen black, rugose and with thin, white, intersegmental membranes; 8th sternum hairy; see figures for details.

MALE. Unknown.

LENGTH. Female body 7.5 mm., wing 4.7 mm.

TYPE LOCALITY. Chatcolet, Idaho, 3-4 July 1963 (M. & H. James).

TYPE DEPOSITED. Washington State College, Pullman, no. 329.

Pseudatrichia rufitruncula Kelsey, new species.
(Figure 27.)

MALE. Head black, not distinctly longer than high; eyes black-brown and with no apparent division into coarse upper and finer lower facets; postocular ridge distinct, elevated and rugose; frons narrow and triangular, separating the eyes by the width of the median ocellus, lower frons rugose with the margins next to eyes shining; ocellar tubercle black and rugose, sharply cut off from postocular ridge; ocelli clear; back of head concave below ocellar tubercle; mouthparts orange-brown and well developed, but palpi lighter, slender, and two-thirds the length of the rostrum; antennae with first segment brown and short; second orange-brown and longer than first; third segment orange-brown, oval about twice as long as broad, and with two lateral points and a distinct median peg at apex; see figures for details.

Thorax dorsum black, rugose, and with a patch of white pilosity anterior to each humeral callus; humeral callus red-orange; pleuron dark red-brown and shining; wings hyaline with orange-brown veins; halter stem red-brown, knob with base red-brown and remainder white; legs orange-brown but hind femora darker distally.

Abdomen black, rugose, with a purple metallic sheen, and with segments 3 and 4 showing narrow white membranes, except 7th segment red-brown and 9th segment black-brown; see figures for details.

FEMALE. Head black, longer than high; eyes black-brown and elongate; postocular flange broad, subshining, and extending posteriorly farther than ocellar tubercle; frons narrow, covered with several rows of recumbent, anteriorly directed hairs, and produced in a rounded bulge above antennae; ocellar

tubercle black and shining; ocelli orange-brown; mouthparts as in the male; antennae with first two segments short, black, and granular, third red-brown, oval truncated, and with median peg at tip; see figures for details.

Thorax black, depressed, granular, and with anterodorsal portion pointed; humeral and supraalar calli red-brown; pleural areas black and subshining; wings tinged brown and with microtrichia and veins brown; halter stem brown and knob red-brown, elongate, and pointed; legs orange-brown, with hind femora and tibiae darker.

Abdomen with first seven segments black, rugose, and with a metallic sheen; 8th dark red-brown, elongate, with dorsum pointed and sternum hairy; see figures for details.

LENGTH. Male body 7.5 mm., wing 4.5 mm., female body 7.5 mm., wing 3.7 mm.

TYPE LOCALITY. Chisos Basin, Big Bend National Park, Texas, 20 April 1959 (Howden & Baker).

HOLOTYPE MALE DEPOSITED. Canadian National Collection, no. 11430.

ALLOTYPE FEMALE. Chis, N. Chiapas (3 km. S. Oaxaca, Rt. 190, 5-600'). Mexico, 12 July 1962 (H. E. Milliron), deposited in Canadian National Collection.

Pseudatrichia schlingeri Kelsey, new species.
(Figure 28.)

FEMALE. Head black, eyes red-brown; postocular flange broad and rising to a ridge which drops sharply to the back of the head, narrowly separated on back of head by the ocellar tubercle; back of the head nearly flat; frons subshining, slightly broader than ocellar tubercle, and with two diverging bands of anteriorly directed hairs extending from before the median ocellus to laterad of the antennal bases; ocellar tubercle prominent, cut off by two deep grooves running from the upper corners of eyes to behind the ocellar tubercle, but not joining on the back of the head; oral cavity deep, bordered laterad of the antennae by silvery pile; mouthparts brown, filling two-thirds of oral opening, and palpi short; antennae black-brown, the first two segments short, the third oval, with bluntly bifurcated tip, and covered with very short hairs that give a brownish color; see figures for details.

Thorax black, subshining, and transversely striated; humeral callus with posterior tip orange; scutellum black; precoxal area of prothorax with gray pollen, remainder of pleural areas black-brown and subshining; wings hyaline with brown veins; halter stem brown and knob with base brown, but remainder white; legs with coxae orange, femora orange, darkening to orange-brown, tibiae orange-brown and tarsi brown.

Abdomen black, except 8th sternum red-brown at base, proximal segments rugose with a faint metallic sheen; 8th sternum smoothly rounded at tip; see figures for details.

MALE. Unknown.

LENGTH. Female body 5.7 mm., wing 3.7 mm.

TYPE LOCALITY. Riverside, Riverside County, California,

1 May 1966 (E. I. Schlinger).

HOLOTYPE DEPOSITED. California Academy of Sciences, no. 10645 (ex University of California, Riverside).

PARATYPE. 1 female, Riverside, Riverside County, California, 6 April 1967 (Saul Frommer) in University of California, Riverside.

GENUS BELOSTA D. E. HARDY

New material received recently from the Department of Entomology of the University of California at Riverside contained the two new species of Belosta described below. Added to the five previously described (Kelsey 1969), this increases the known species to seven. Although one of the new species, a pair, was collected on the windows of a laboratory, no new clues on the biology of the genus were obtained.

The following key to the genus has been completely revised to include all described species.

Key to the species of Belosta

1. Males; eyes close together 2
Females; eyes widely separated 5
2. (1) Halter knob white above, or marked with
red-brown 3
Halter knob tan; thorax with short white
hairs B. albipilosa Hardy
3. (2) Halter knob white above 4
Halter knob with base cream and a red-
brown band down center; thorax with
medium long white hairs
. B. albicomula Kelsey, new species
4. (3) Halter knob all white; thorax with
long white hairs B. pilosa (Coquillett)
Halter knob white above with lateral margin
and ventral surface tan; thorax with very
short scale-like hairs B. viticolapennis Kelsey
5. (1) 8th sternum long, sloping, without a
brush of hairs 7
8th sternum short, abrupt, with a ventral
brush of stiff spines 6
6. (5) Halter knob orange; thorax with mixed
short red and white hairs B. albipilosa Hardy
Halter knob with base and dorsal rib brown,
a white semicircle around the brown
knob, ventral surface white; thorax
with short white hairs; frons with a
creamy diamond on upper portion
. B. scutulamacula Kelsey, new species
7. (5) Halter knob red-brown or marked with
red-brown 8
Halter knob orange; thorax with long
white hairs B. pilosa (Coquillett)

8. (7) Halter knob red-brown above, lighter below 9
 Halter knob white, and with a longitudinal
 band of red-brown, thorax with patches of
 short white hairs . B. albicomula Kelsey, new species
9. (8) Halter knob with ventral tip white. B. telfordi Kelsey
 Halter knob cream below B. termitophaga Kelsey

Belosta albicomula Kelsey, new species.
 (Figure 29.)

This new species closely resembles B. pilosa (Coquillett) but differs in many small ways. The pile hairs of the thorax are shorter, the antennae are longer and less swollen in the center, the halteres are colored differently, and the terminalia of both sexes show distinct differences.

MALE. Head black, higher than long; eyes black-brown above, black below, and extending to the back of the head dorsally; mouthparts atrophied, palpi club-shaped, extending one-third the length of the oral cavity; lower postgenae covered with medium-long white hairs; frons shining, triangular, and extending dorsally as a thin band between the eyes to the median ocellus; ocellar tubercle elevated and distinct; ocelli red-brown; antennae black-brown, with the first two segments short, third segment lighter at tip, diamond shaped, and three times as long as wide, with greatest width at midpoint; see figures for details.

Thorax with the dorsum black, covered with medium-long white hairs, much like B. pilosa except shorter; humeral and supraalar calli orange-brown; scutellum black and hairy; wings hyaline, with tan veins; halter stem red-brown, knob cream with red-brown longitudinal band; legs with coxae to femora red-brown and with yellow knees and hairy; tibiae yellow, darkening to red-brown distally; tarsi red-brown.

Abdomen black, sparsely haired on basal segments, with intersegmental membranes white posteriorly and yellow laterally; terminalia short; sternal comb thin; aedeagus with short parameres; 9th segment claspers broadly rounded at tip; see figures for details.

FEMALE. Head mostly orange-brown, darker below eye margin, with the back of the head black-brown medially, higher than long; eyes black-brown; mouthparts atrophied, palpi black-brown and club-shaped; frons broad, smooth, shining, with a median depression and black bands extending from the eye margins laterad of the antennal bases to the ocellar tubercle, giving the frons the appearance of being black with an orange median area and two lateral orange patches above the eyes; ocellar tubercle black; ocelli black-brown; antennae black-brown, the first two segments black, and short (third segment lost); see figures for details.

Thorax dorsum black, shining, and thinly covered with sparse patches of short white pile; humeral callus cream with a median brown spot; supraalar callus orange-brown; propleuron cream and brown, mesopleuron black, with short white hairs; wings hyaline, with brown veins; halter stem black-brown and

knob white with a longitudinal band of red-brown; legs with coxae to femora dark red-brown and with yellow knees; tibiae yellow darkening to red-brown distally; tarsi red-brown.

Abdomen black with white intersegmental membranes; 8th tergum marked with orange laterally; 8th sternum elongate and toothed distolaterally; see figures for details.

LENGTH. Male body 5.7 mm., wing 4.1 mm; female body 7.5 mm., wing 5.0 mm.

TYPE LOCALITY. Riverside, California, 1 June 1964 (E. I. Schlinger).

TYPE DEPOSITED. California Academy of Sciences, no. 10101 (ex University of California, Riverside).

ALLOTYPE. Female; same date as type; deposited in California Academy of Sciences.

Belosta scutulamacula Kelsey, new species.
(Figure 30.)

This species is quite close to B. albipilosa Hardy, but may be separated from it by the white diamond-shaped marking in a dark field on the upper frons anterior to the median ocellus, the absence of the dark spot below the eye of the female, the thorax being covered with a pile of very short hairs giving a dusty appearance, the halter color, the appearance of the 7th sternum, the shape of the 8th and 9th tergites, and the shorter spermatheca.

FEMALE. Head color basically creamy white, but back of head dark red-brown, head higher than long; eyes black-brown; a groove extending from the upper corner of the eye to the lateral ocellus; a narrow red-brown band posterior to this groove; frons shining, two grooves extend from laterad of the ocellar tubercle to laterad of the antennal bases; central area of frons dark brown with a creamy diamond on the upper half, the dorsal point of which touches the median ocellus; the area between the grooves and eye margins marked with brown; ocellar tubercle dark red-brown; ocelli red-orange; oral cavity white; mouthparts atrophied, palpi red-brown and short; antennae brown, the first two segments short, third oval and about twice as long as wide; see figures for details.

Thorax with dorsum black, clothed with short white hairs giving a dusty appearance (hairs shorter than those of B. albipilosa and none reddish); humeral and supraalar calli creamy white; pleural areas black with long white hairs; wings hyaline, iridescent under reflected light, with yellow-brown veins; halter stem brown and knob with base and dorsal rib brown, a white semicircle around the brown base, and ventral surface white; legs dark red-brown, except knees of femora creamy white.

Abdomen red-brown with a white posterior membrane on all segments; 7th sternum with a fringe of spines; 8th sternum short, abrupt, with a median brush of stiff spines, basal portion with pits only, 9th tergum pointed; spermatheca elongate, but only a little over half as long as that of B. albipilosa; see figures for details.

MALE. Unknown.

LENGTH. Female body 5.5 mm., wing 3.6 mm.

TYPE LOCALITY. Los Prietos Campground, Santa Barbara County, California, 30 July 1965, (J. Bath, B. Ruge).

TYPE DEPOSITED. California Academy of Sciences, no. 10102 (ex University of California, Riverside).

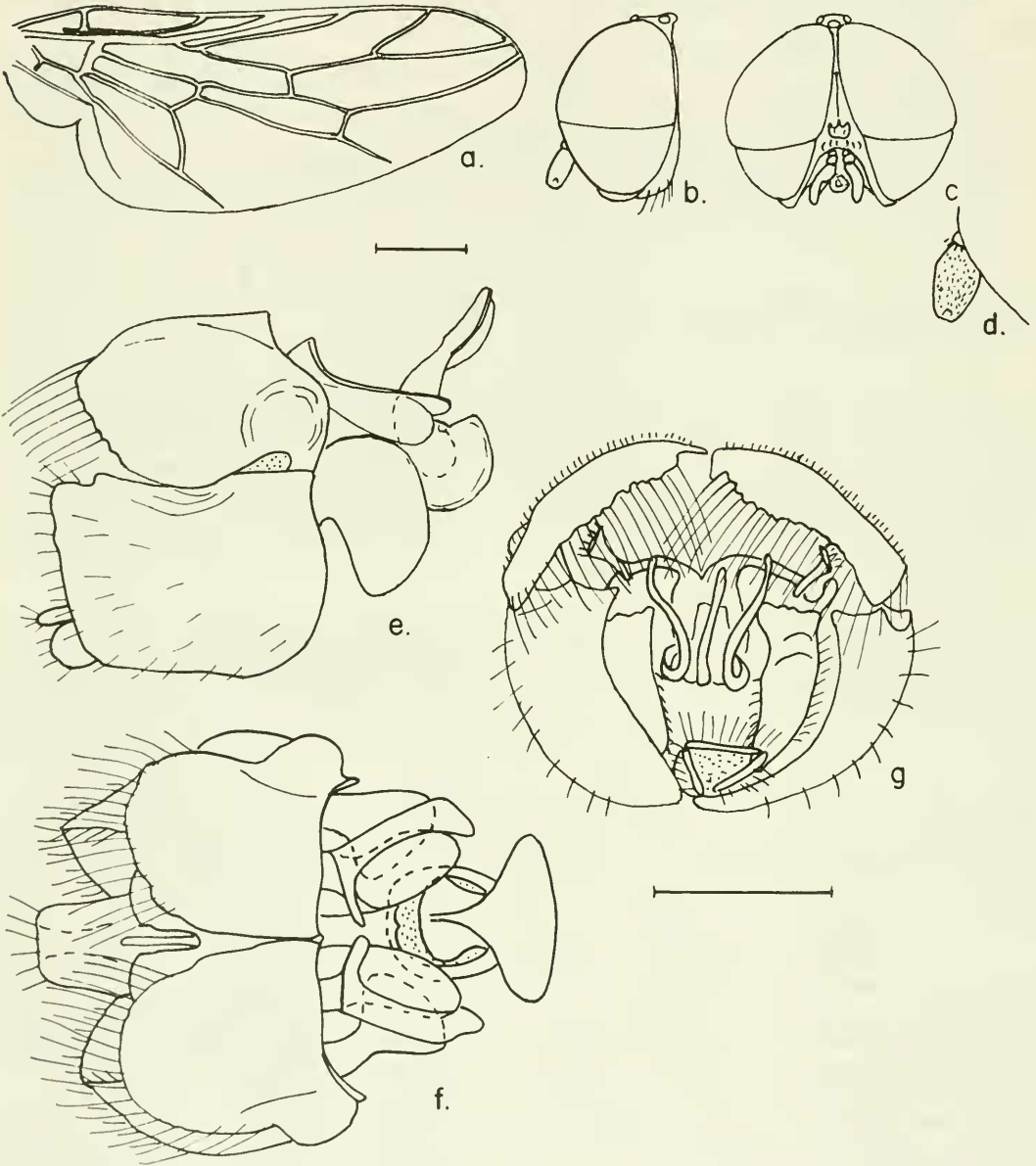


FIGURE 1. *Scenopinus estesi* Kelsey, new species, male: a., wing; b. and c., lateral and frontal aspects of head; d., enlarged detail of antenna; e., f., and g., lateral, ventral (physically dorsal) and posterior aspects of terminalia.

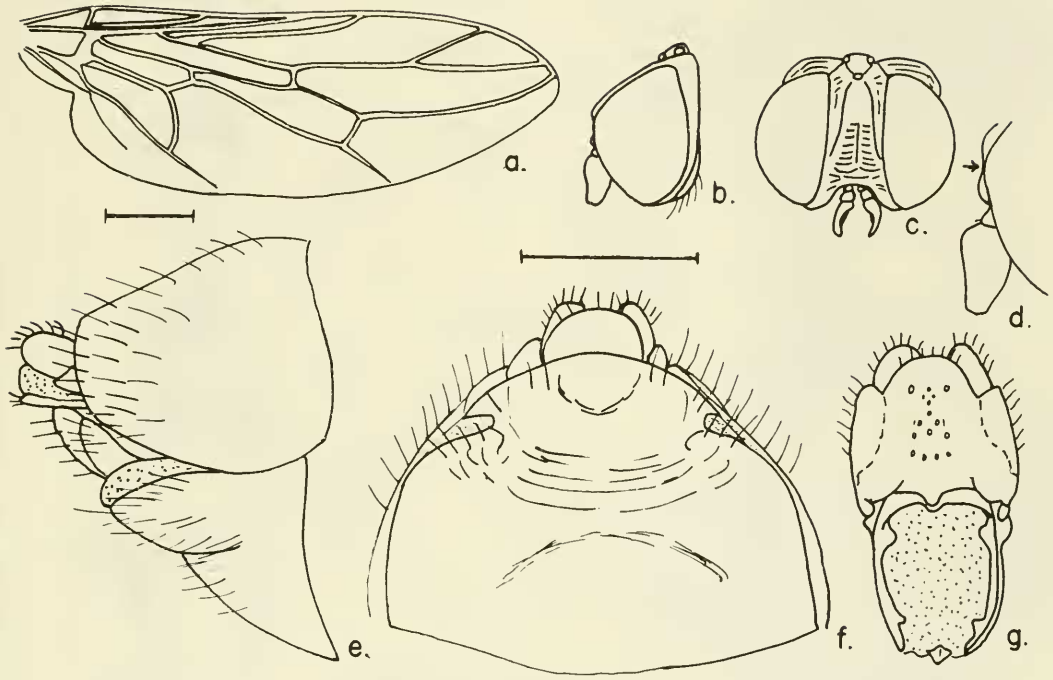


FIGURE 2. Scenopinus transversus Kelsey, new species, female: a., wing; b. and c., lateral and frontal aspects of head; d., enlarged detail of antenna and transverse groove on lower frons; e. and f., lateral and ventral aspects of 8th and 9th segments; g., 9th sternum and roof of bursa.

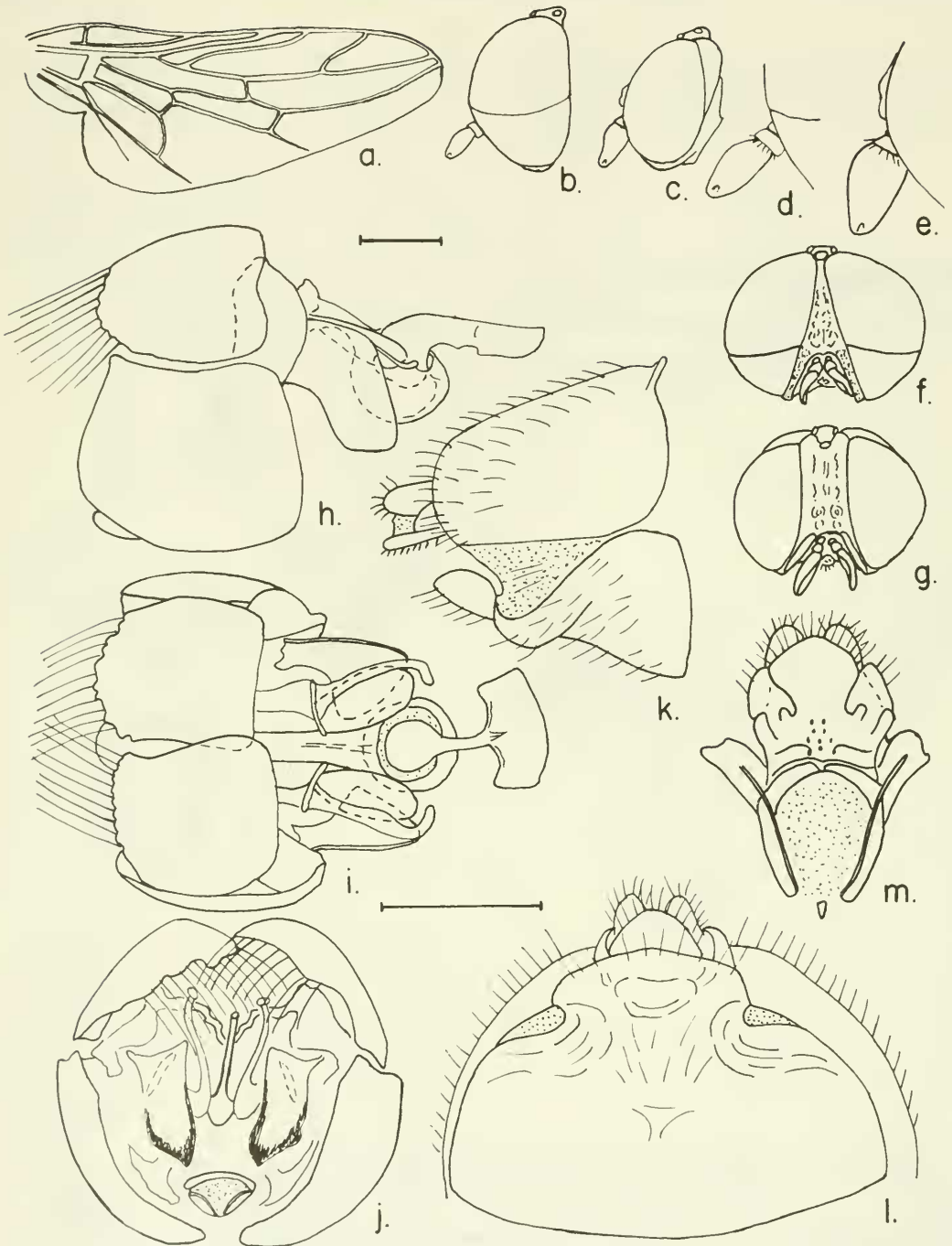


FIGURE 3. *Scenopinus vockerothi* Kelsey, new species, male and female; a., wing; b. and c., lateral aspects of male and female heads; d. and e., enlarged details of male and female antennae; f. and g. frontal aspects of male and female heads; h., i., and j., lateral, dorsal (physically ventral), and posterior aspects of male terminalia; k. and l., lateral and ventral aspects of female 8th and 9th segments; m., female 9th sternum and bursa.

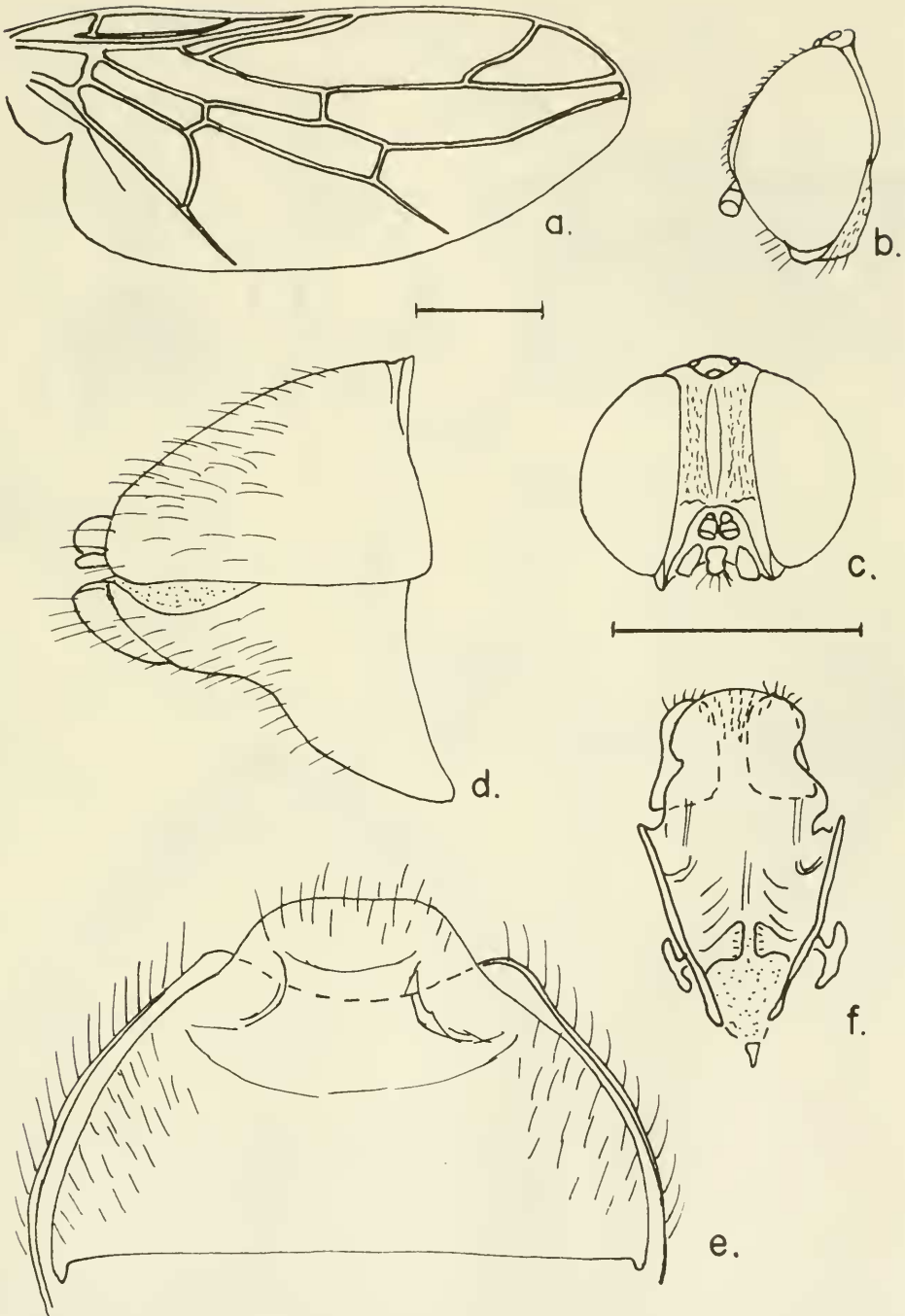


FIGURE 4. Scenopinus albipilosus Kelsey, new species, female; a., wing; b. and c., lateral and frontal aspects of head; d. and e., lateral and ventral aspects of 8th and 9th segments; f., 9th sternum and roof of bursa.

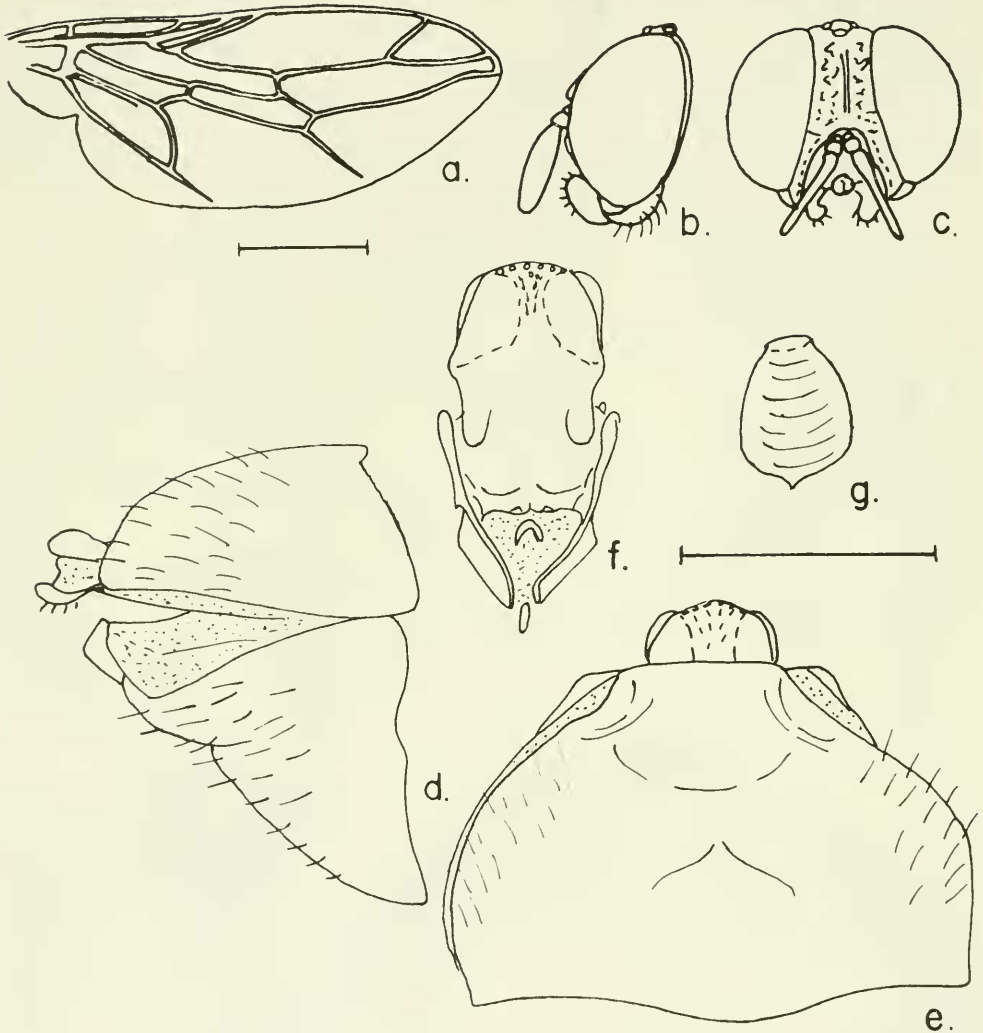


FIGURE 5. *Scenopinus aurantipalpus* Kelsey, new species, female; a., wing; b. and c., lateral and frontal aspects of head; d. and e., lateral and ventral aspects of 8th and 9th segments; f., 9th sternum and roof of bursa; g., spermatheca.

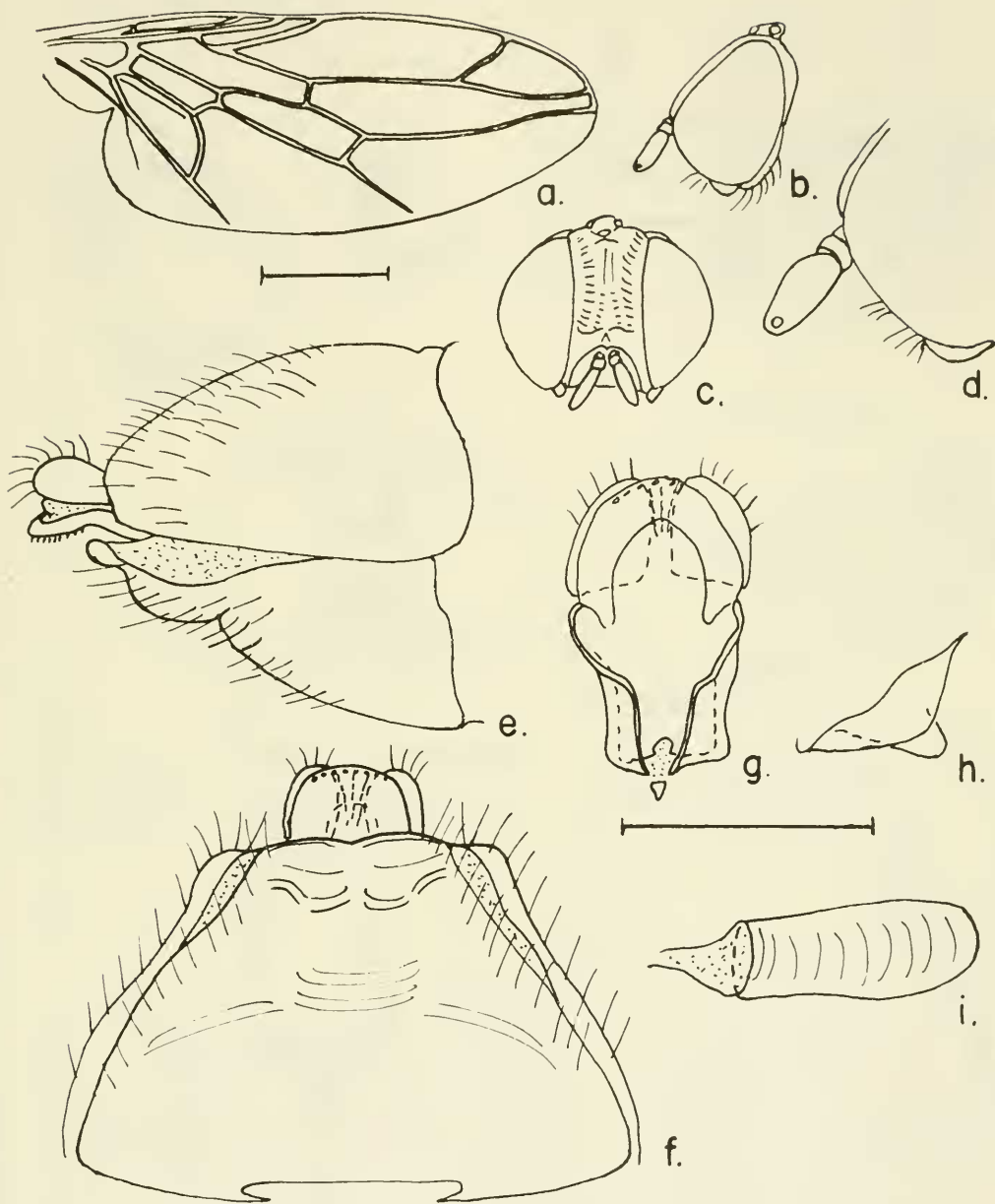


FIGURE 6. Scenopinus dietricki Kelsey, new species, female: a., wing; b. and c., lateral and frontal aspect of head; d., enlarged detail of antenna; e. and f., lateral and ventral aspect of 8th and 9th segments; g., 9th sternum and roof of bursa; h., lateral view of bursa; i., spermatheca.

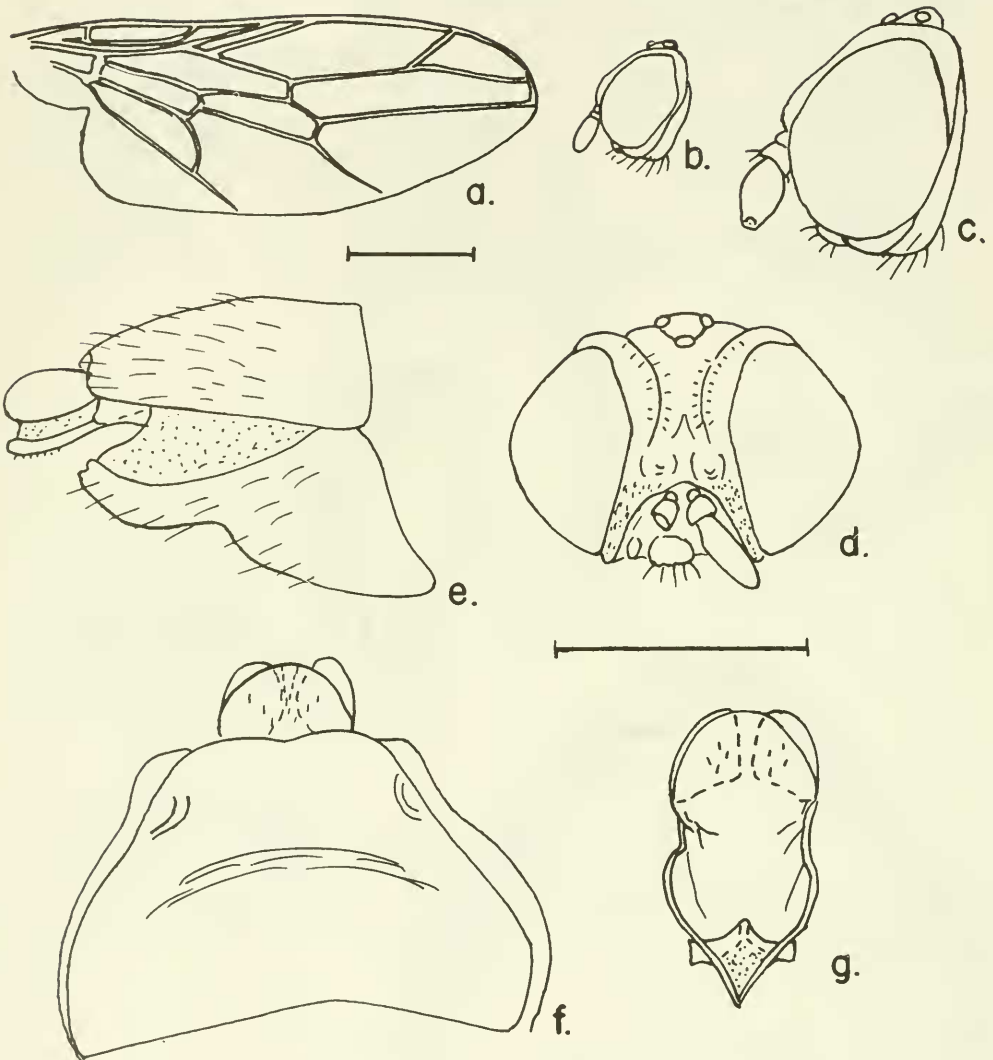


FIGURE 7. *Scenopinus foxi* Kelsey, new species, female: a., wing; b., lateral aspect of head; c. and d., enlarged lateral and frontal aspects of head; e. and f., lateral and ventral aspects of 8th and 9th segments; g., 9th sternum and roof of bursa.

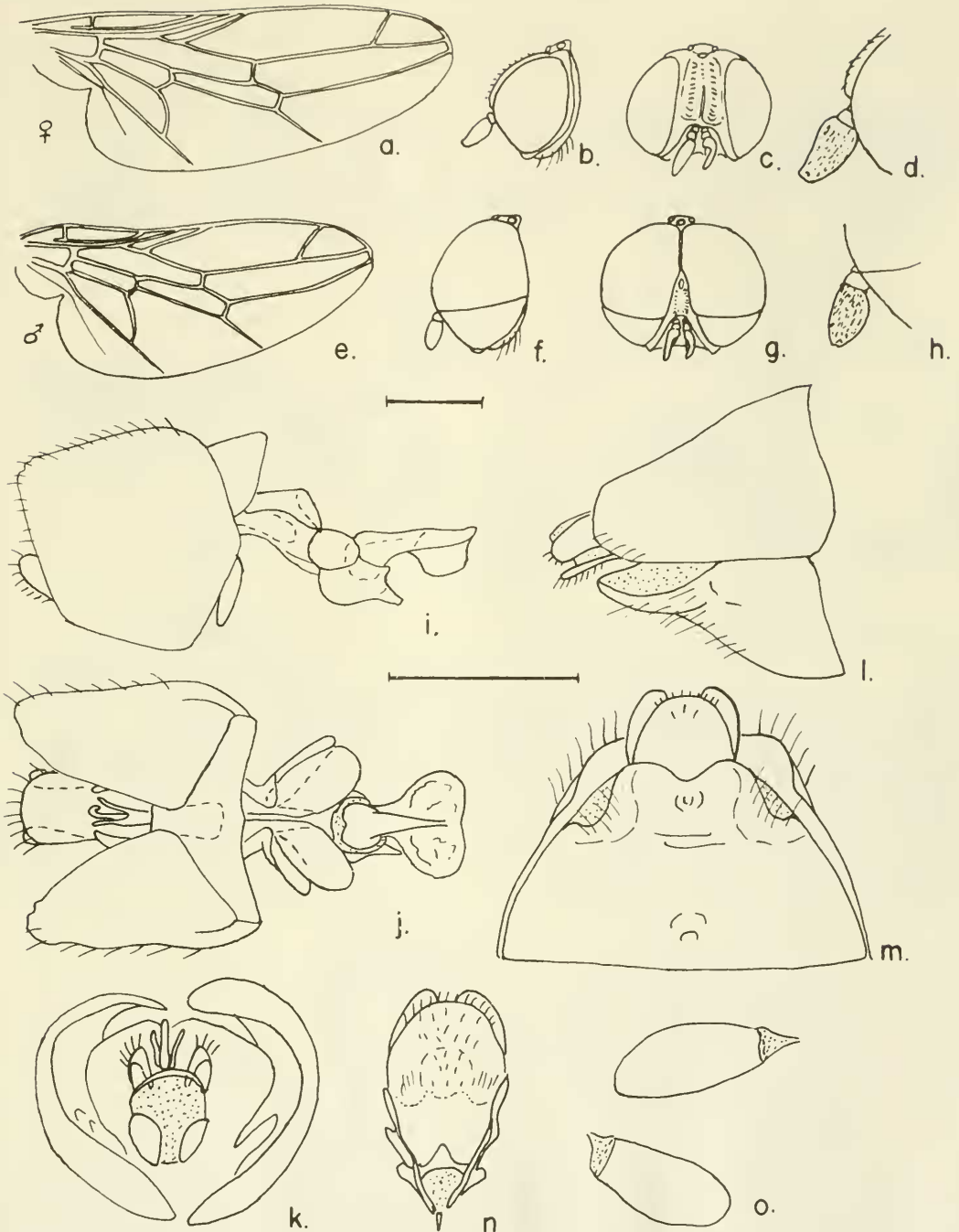


FIGURE 8. *Scenopinus johnsoni* Kelsey, new species, male and female: a., female wing; b. and c., lateral and frontal aspects of female head; d., enlarged detail of female antenna; e., male wing; f. and g., lateral and frontal aspect of male head; h., enlarged detail of male antenna; i., j., and k., lateral, ventral (physically dorsal), and posterior aspects of male terminalia; l. and m., lateral and ventral aspects of female 8th and 9th segments; n., 9th sternum and bursa of female; o., spermathecae.

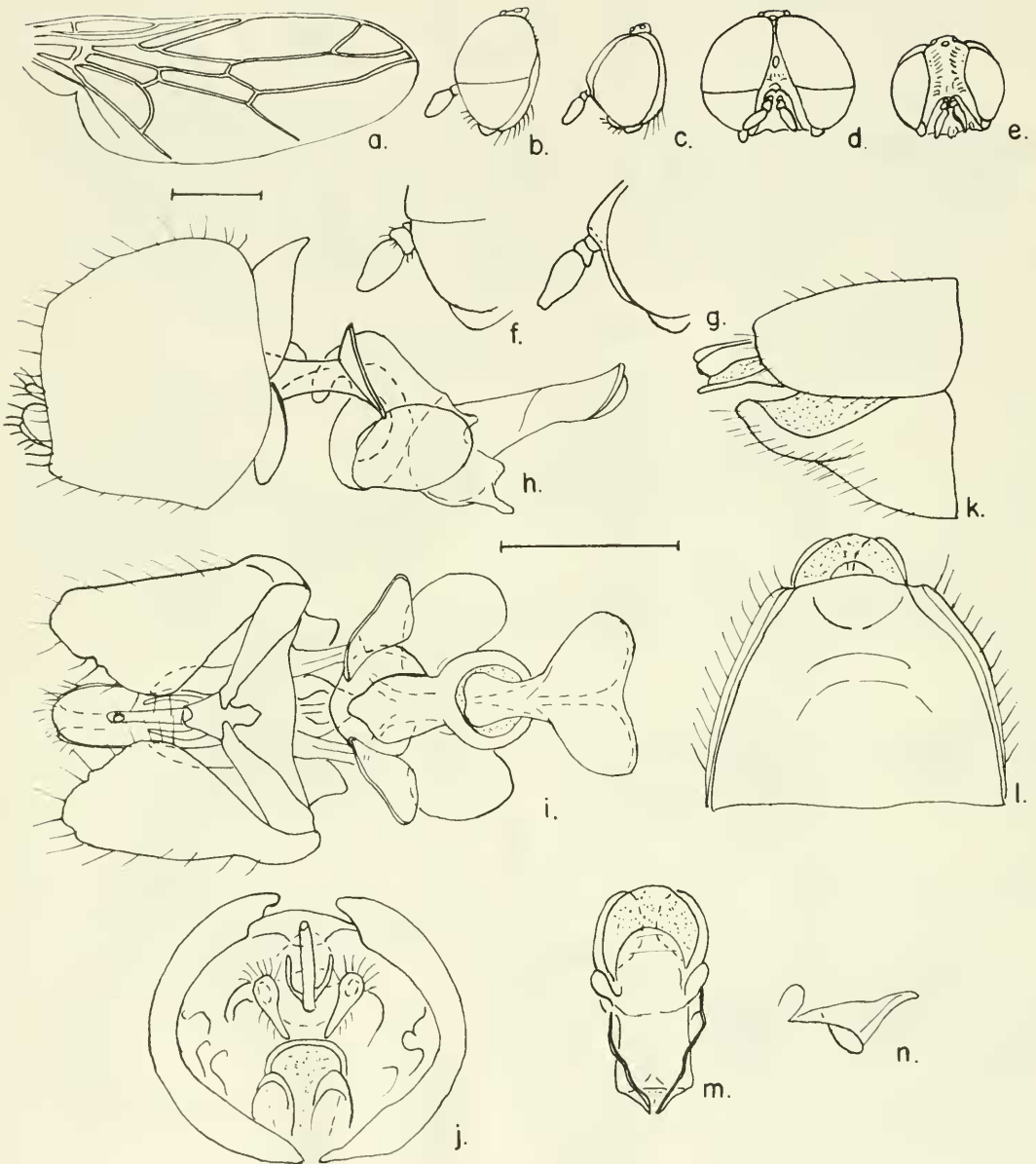


FIGURE 9. *Scenopinus reciprocatus* Kelsey, new species, male and female; a., wing; b., c., d., and e., lateral and frontal aspects of male and female heads; f. and g., enlarged details of male and female antennae; h., i., and j., lateral, ventral (physically dorsal), and posterior aspects of male terminalia; k. and l., lateral and ventral aspects of female 8th and 9th segments; m., female 9th sternum and roof of bursa; n., lateral aspect of female bursa.

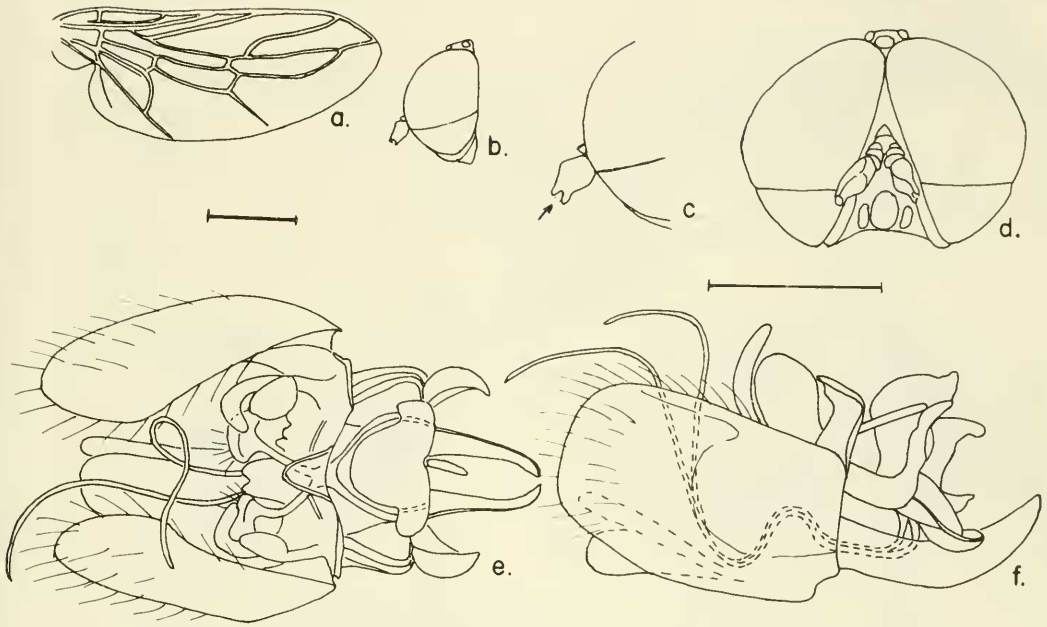


FIGURE 10. *Brevitrichia albinota* Kelsey, new species, male: a., wing; b., lateral aspect of head; c., enlarged detail of antenna; d., enlarged frontal aspect of head; e. and f., ventral (physically dorsal) and lateral aspects of terminalia.

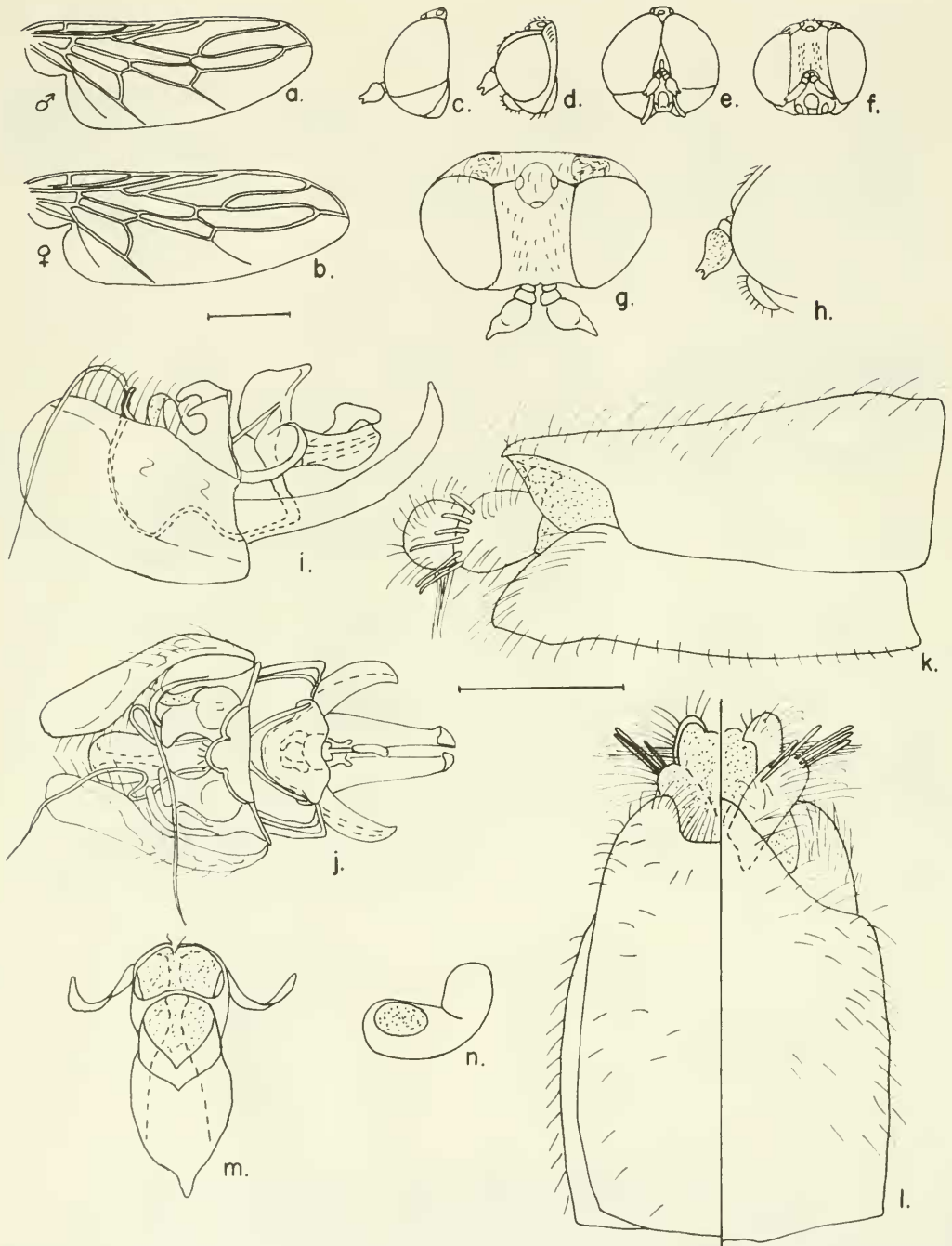


FIGURE 11. *Brevitrichia arena* Kelsey, new species, male and female: a. and b., male and female wings; c., d., e., and f., lateral and frontal aspects of male and female heads; g., enlarged dorsal aspect of female head; h., enlarged detail of antenna; i. and j., lateral and ventral (physically dorsal) aspects of male terminalia; k., lateral aspect of female 8th and 9th segments; l., dorsal, right, and ventral, left, aspects of female 8th and 9th segments; m., female bursa; n., spermatheca.

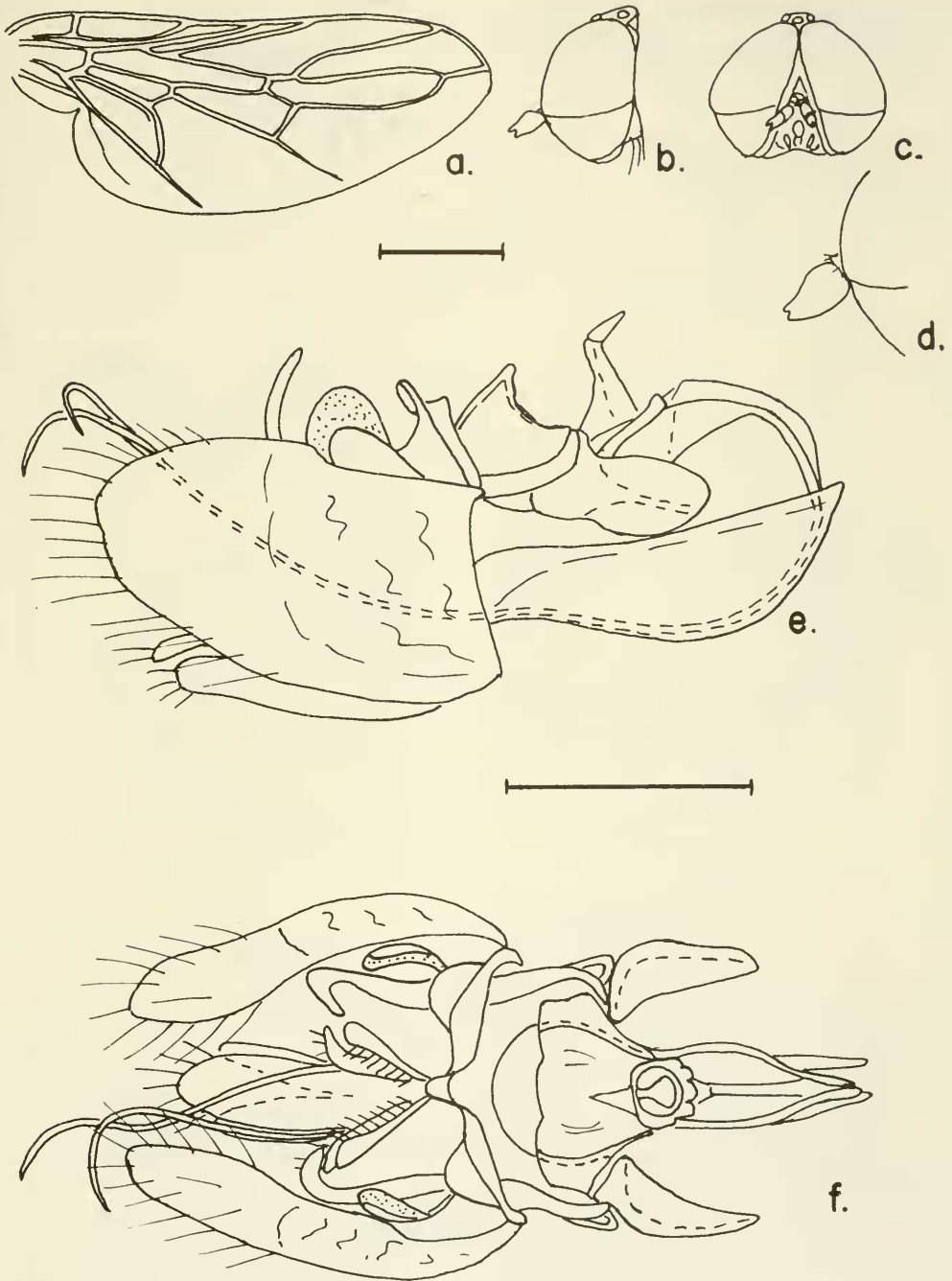


FIGURE 12. Brevitrichia argentaurea Kelsey, new species, male: a., wing; b. and c., lateral and frontal aspect of head; d., enlarged detail of antenna; e. and f., lateral and ventral (physically dorsal) aspects of terminalia.

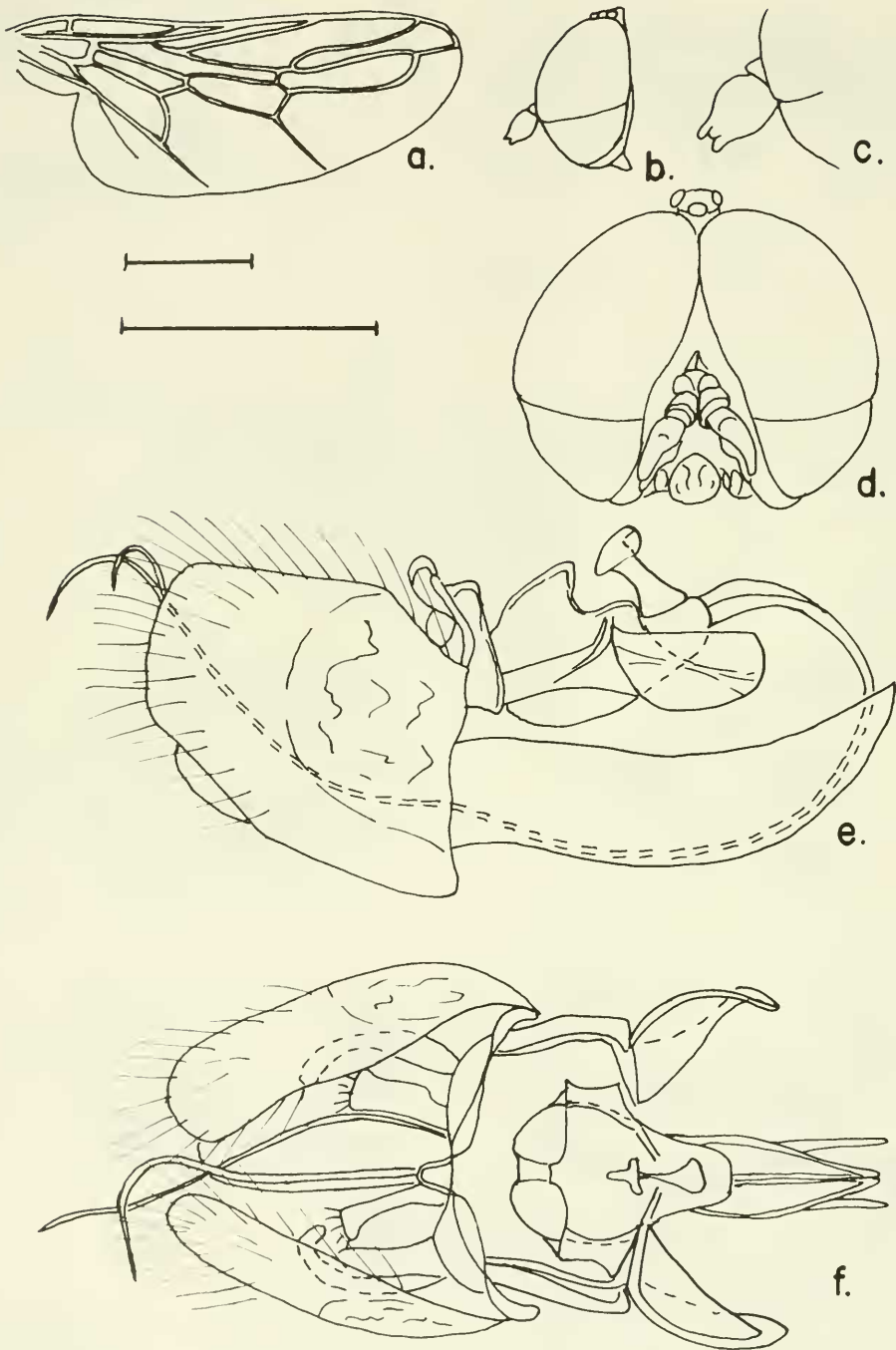


FIGURE 13. *Brevitrichia badiclitella* Kelsey, new species, male: a., wing; b., lateral aspect of head; c., enlarged detail of antenna; d., enlarged frontal aspect of head; e. and f., lateral and ventral (physically dorsal) aspects of terminalia.

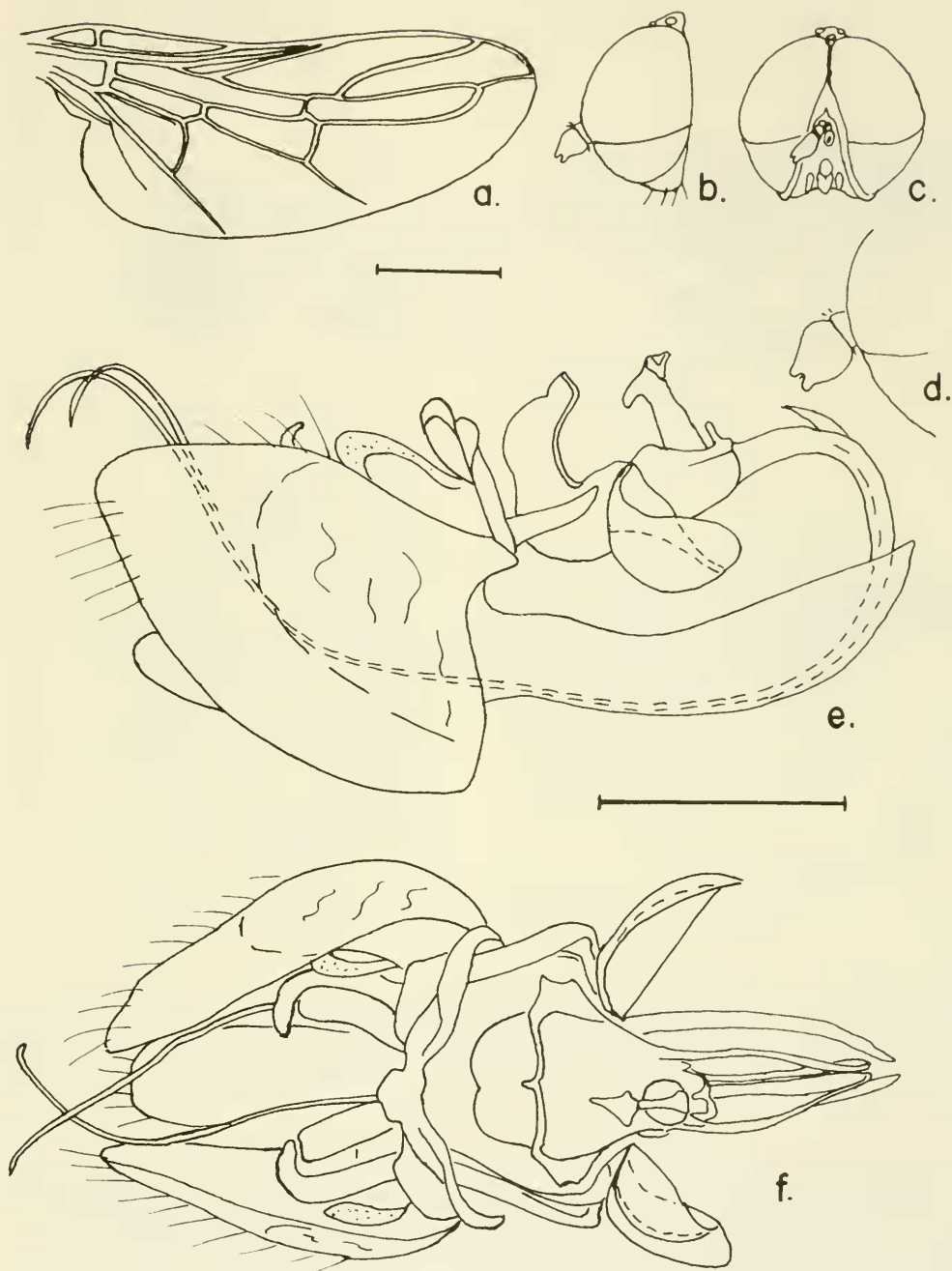


FIGURE 14. *Brevitrichia daileyi* Kelsey, new species, male: a., wing; b. and c., lateral and frontal aspects of head; d., enlarged detail of antenna; e. and f., lateral and ventral (physically dorsal) aspects of terminalia.

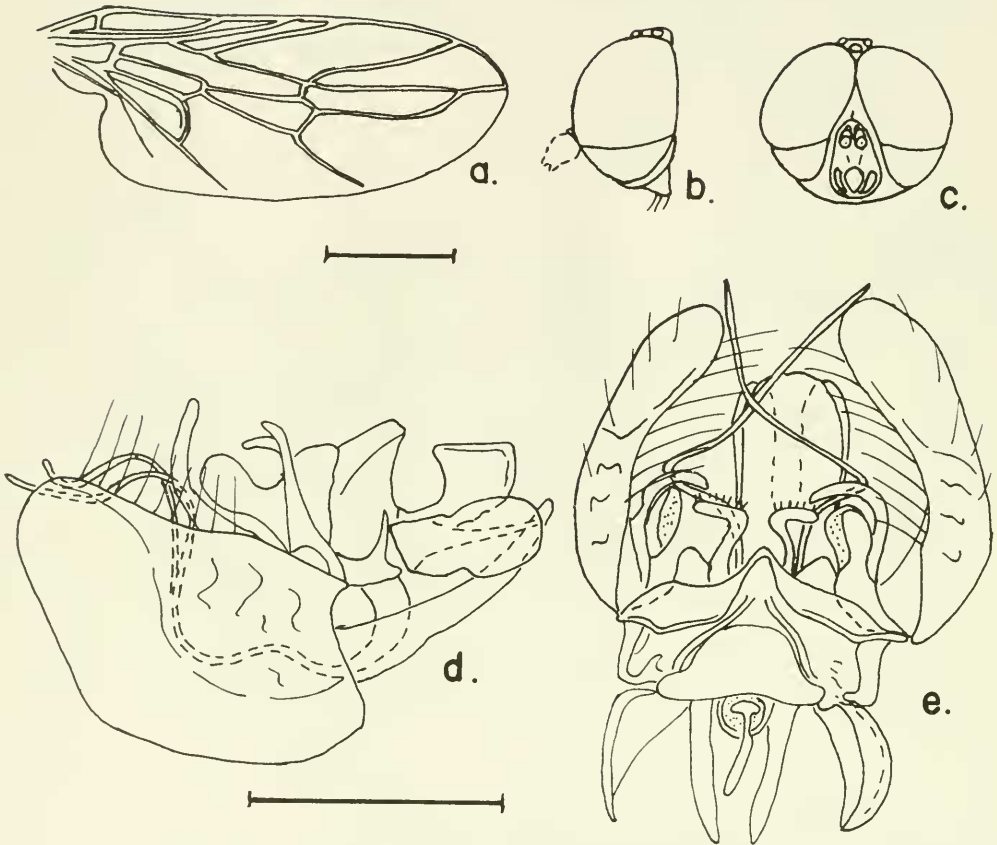


FIGURE 15. *Brevitrichia forficicruxa* Kelsey, new species, male: a., wing; b. and c., lateral and frontal aspects of head; d. and e., lateral and ventral (physically dorsal) aspects of the terminalia.

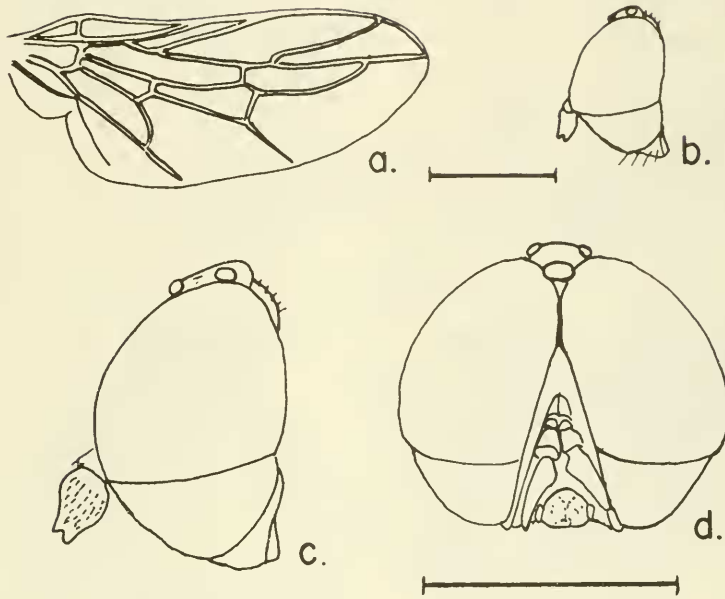


FIGURE 16. Brevitrichia infecacanna Kelsey, new species, male: a., wing; b., lateral aspect of head; c. and d., enlarged lateral and frontal aspects of head.

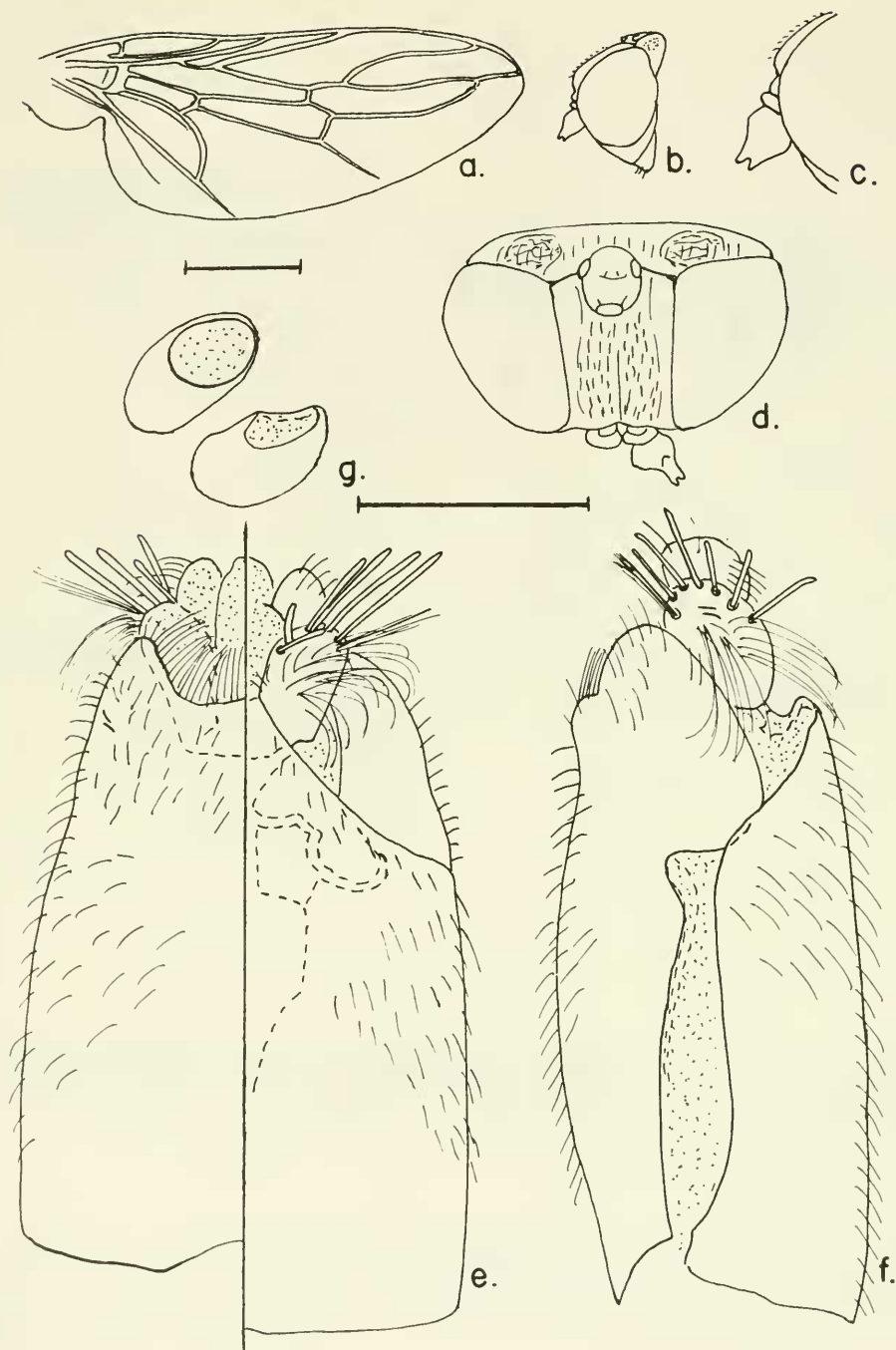


FIGURE 17. *Brevitrichia irwini* Kelsey, new species, female: a., wing; b., lateral aspect of head; c., enlarged detail of antenna; d., enlarged dorsal aspect of head; e., dorsal, right, and ventral, left, aspects of 8th and 9th segments; f., lateral aspects of 8th and 9th segments; g., spermathecae.

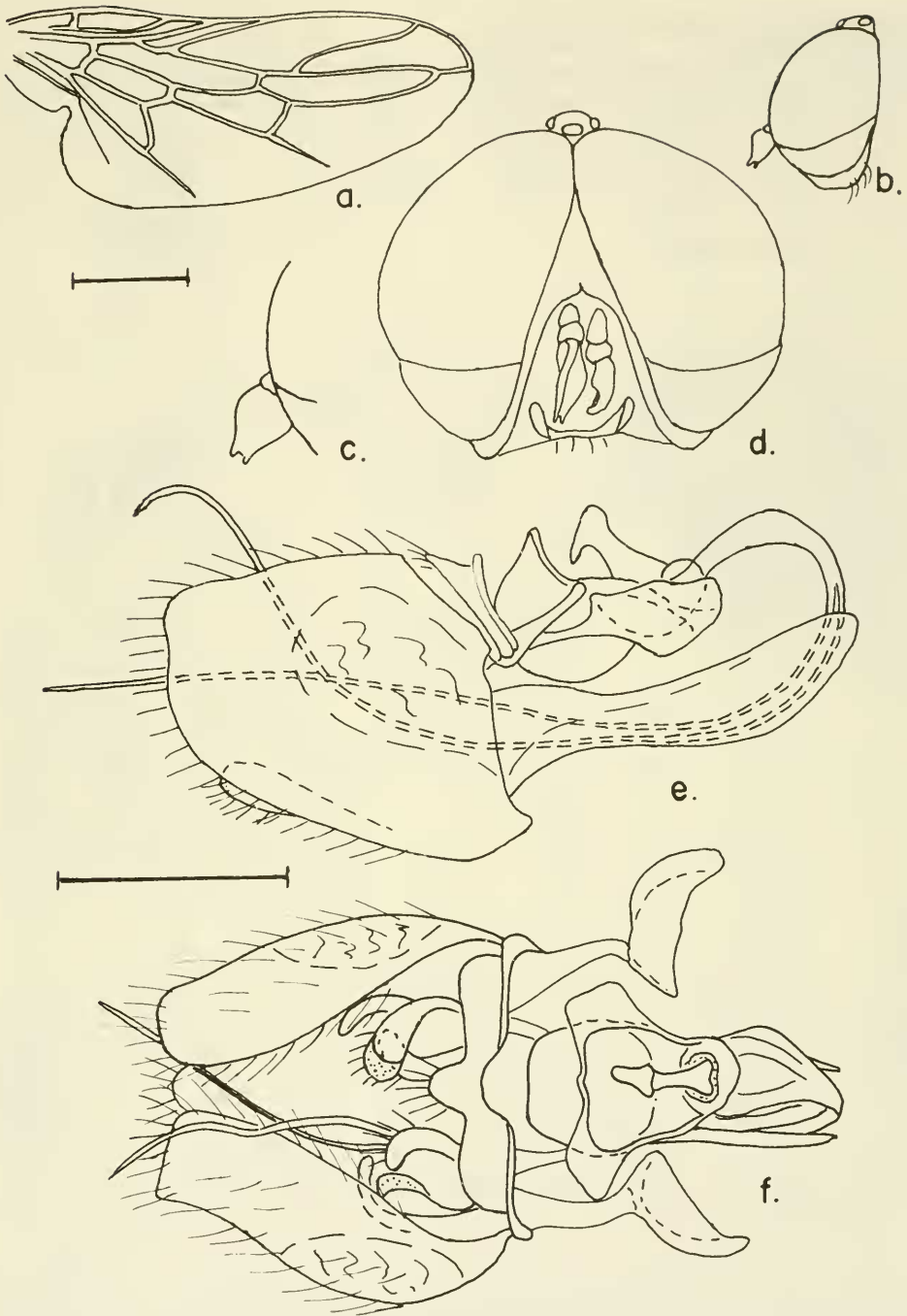


FIGURE 18. *Brevitrichia miraloma* Kelsey, new species, male: a., wing; b., lateral aspect of head; c., enlarged detail of antenna; d., enlarged frontal aspect of head; e. and f., lateral and ventral (physically dorsal) aspects of terminalia.

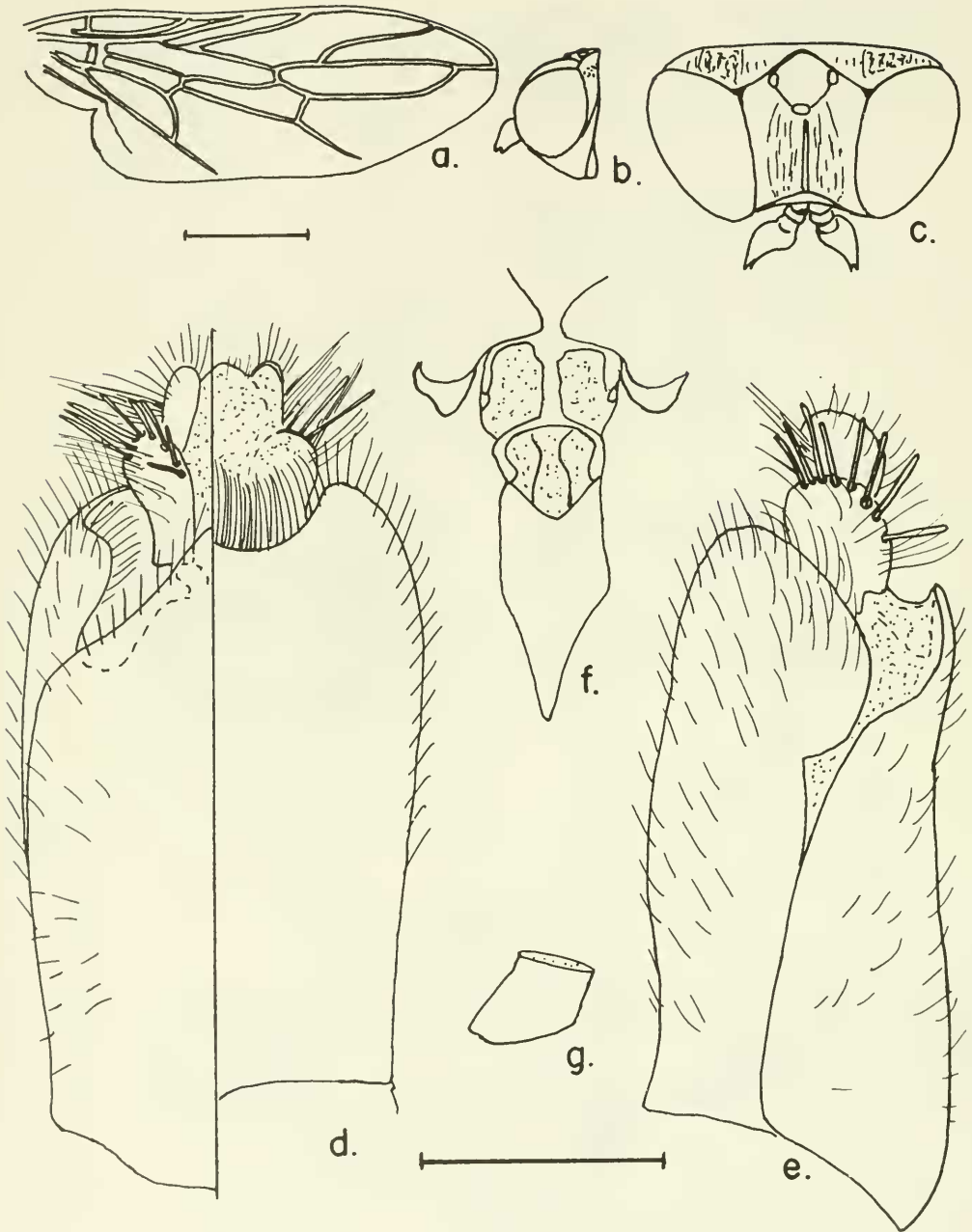


FIGURE 19. *Brevitrichia nayariti* Kelsey, new species, female: a., wing; b., lateral aspect of head; c., enlarged dorsal aspect of head; d., ventral, right, and dorsal, left, aspects of 8th and 9th segments; e., lateral aspect of 8th and 9th segments; f., bursa; g., spermatheca.

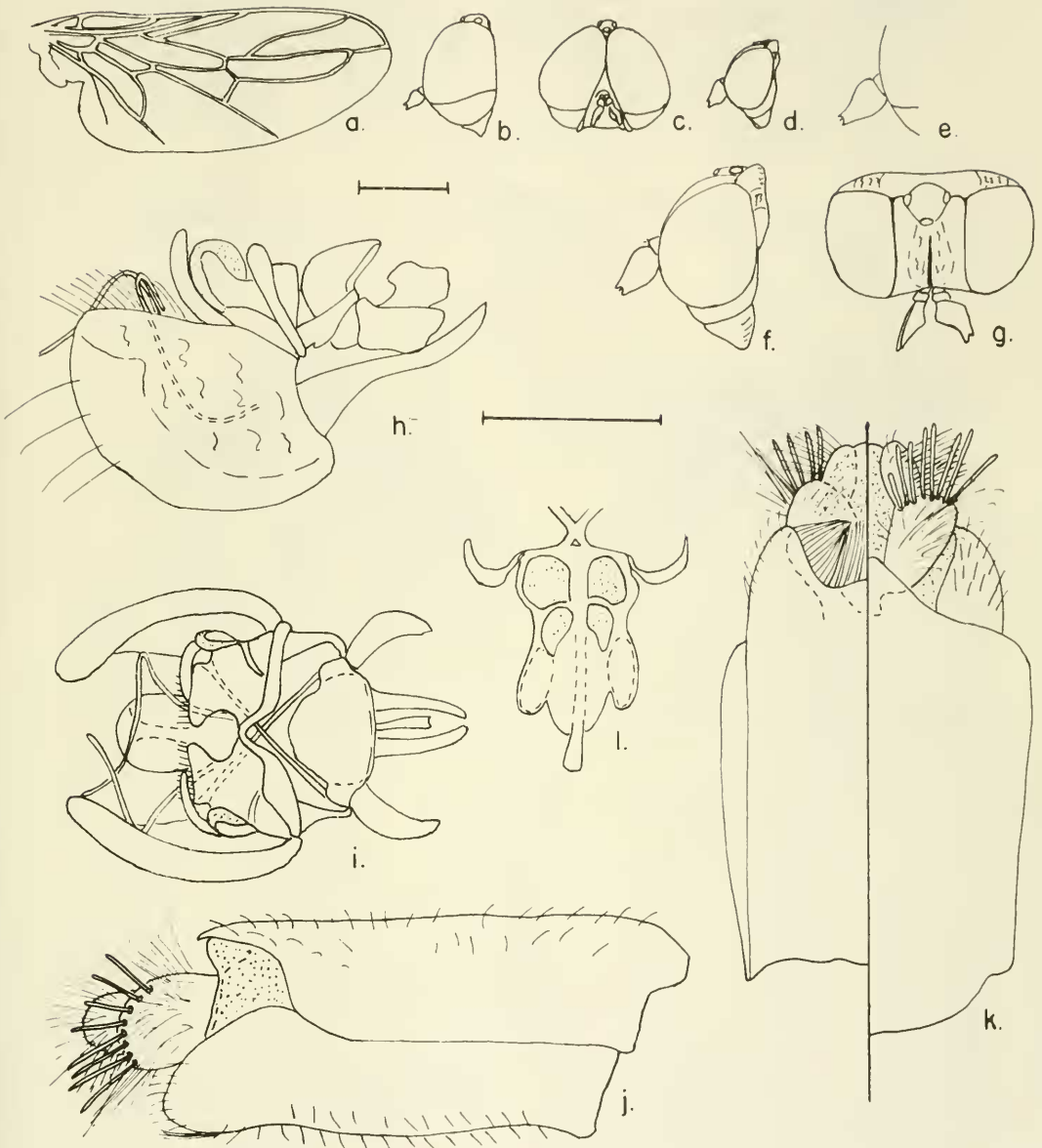


FIGURE 20. *Brevitrichia nevada* Kelsey, new species, male and female: a., wing; b., c., and d., lateral and frontal aspects of male head and lateral aspect of female head; e., enlarged detail of male antenna; f. and g., enlarged lateral and dorsal aspects of female head; h. and i., lateral and ventral (physically dorsal) aspects of male terminalia; j., lateral aspect of female 8th and 9th segments; k., dorsal, right, and ventral, left, aspects of female 8th and 9th segments; l., spermatheca.

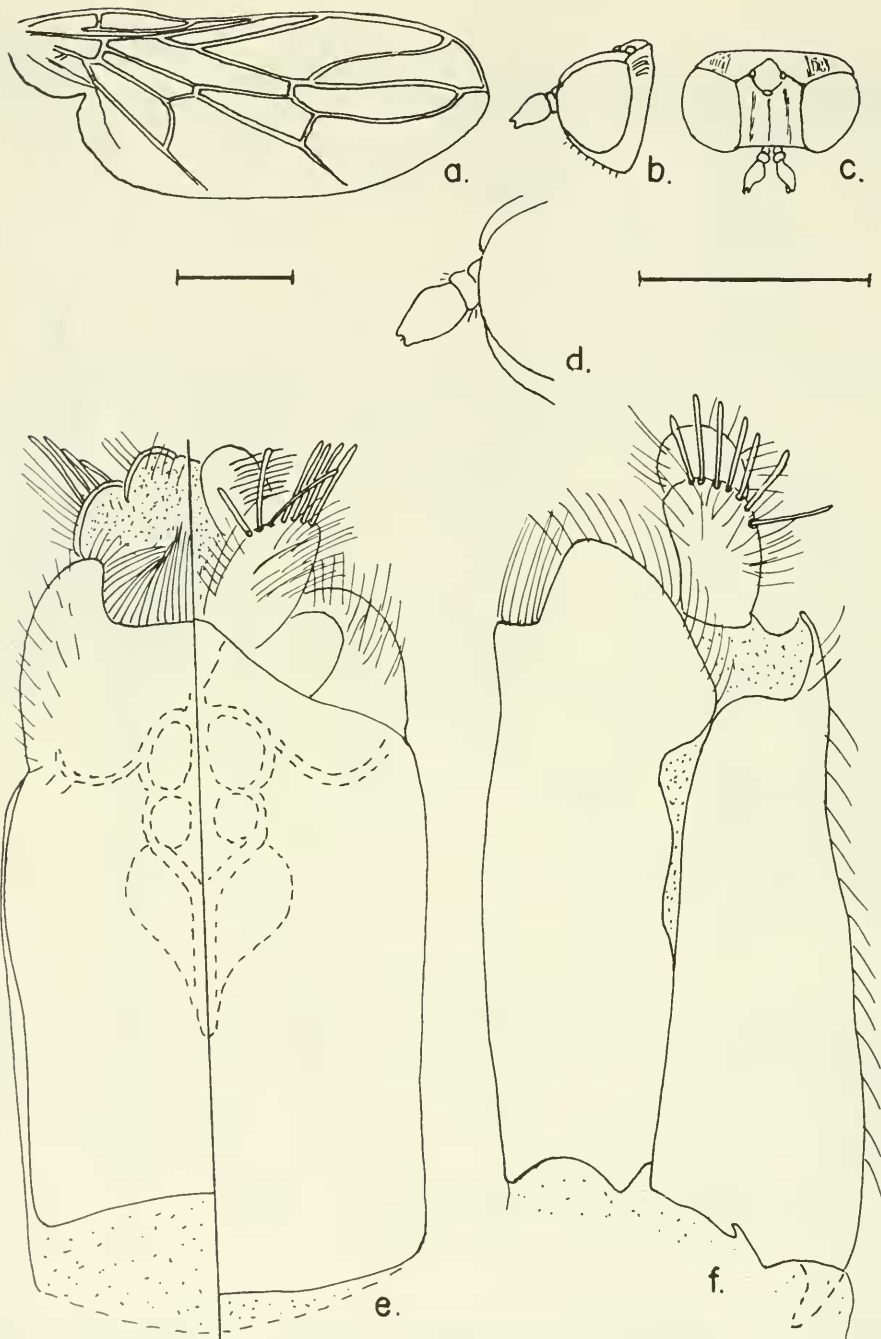


FIGURE 21. *Brevitrichia palida* Kelsey, new species, female: a., wing; b. and c., lateral and dorsal aspect of head; d., enlarged detail of antenna; e., dorsal, right, and ventral, left, aspect of 8th and 9th segments, bursa outlined; f., lateral aspect of 8th and 9th segments.

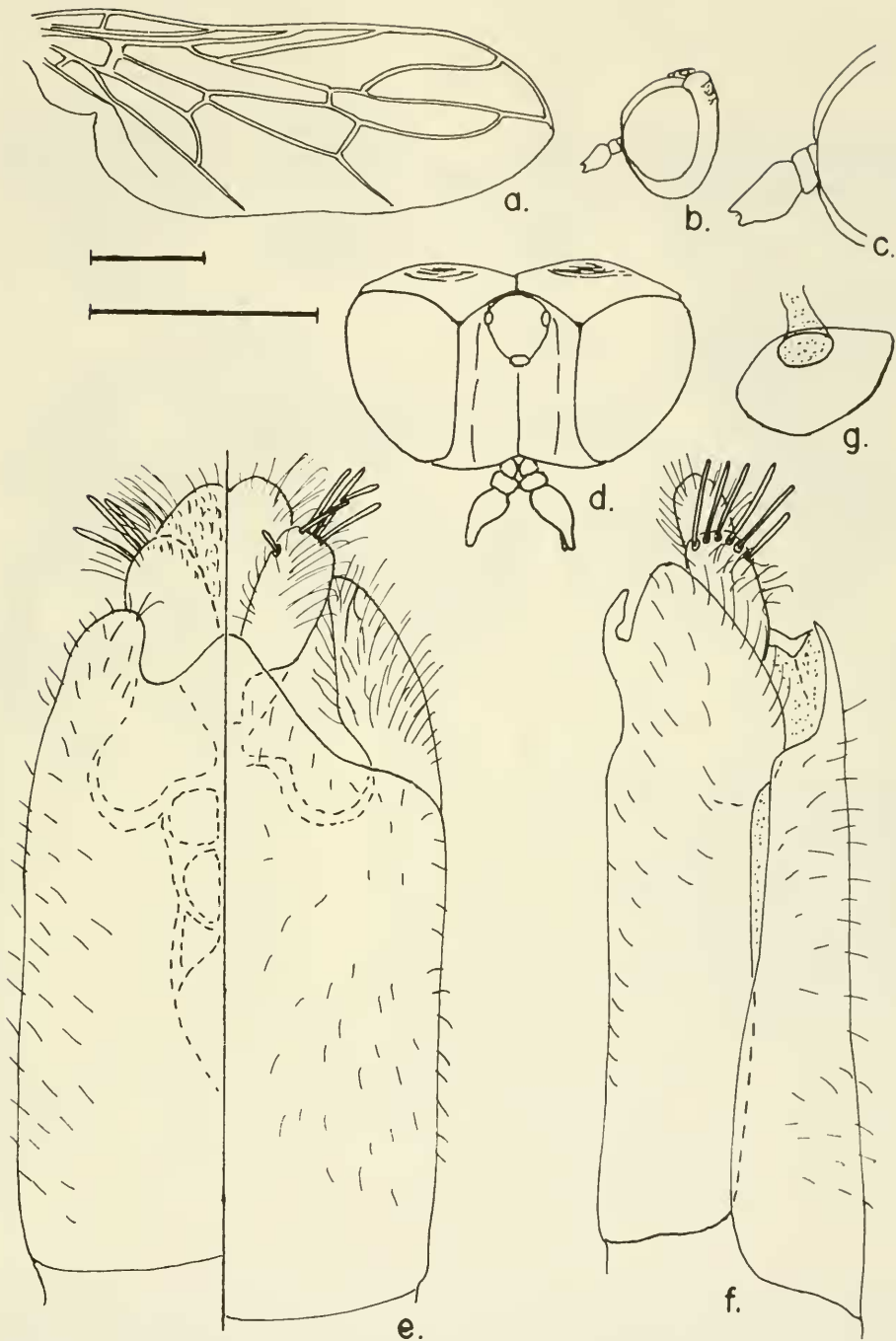


FIGURE 22. *Brevitrichia palmacanna* Kelsey, new species, female: a., wing; b., lateral aspect of head; c., enlarged detail of antenna; d., enlarged dorsal aspect of head; e., dorsal, right, and ventral, left, aspects of 8th and 9th segments, bursa outlined; f., lateral aspect of 8th and 9th segments; g., spermatheca.

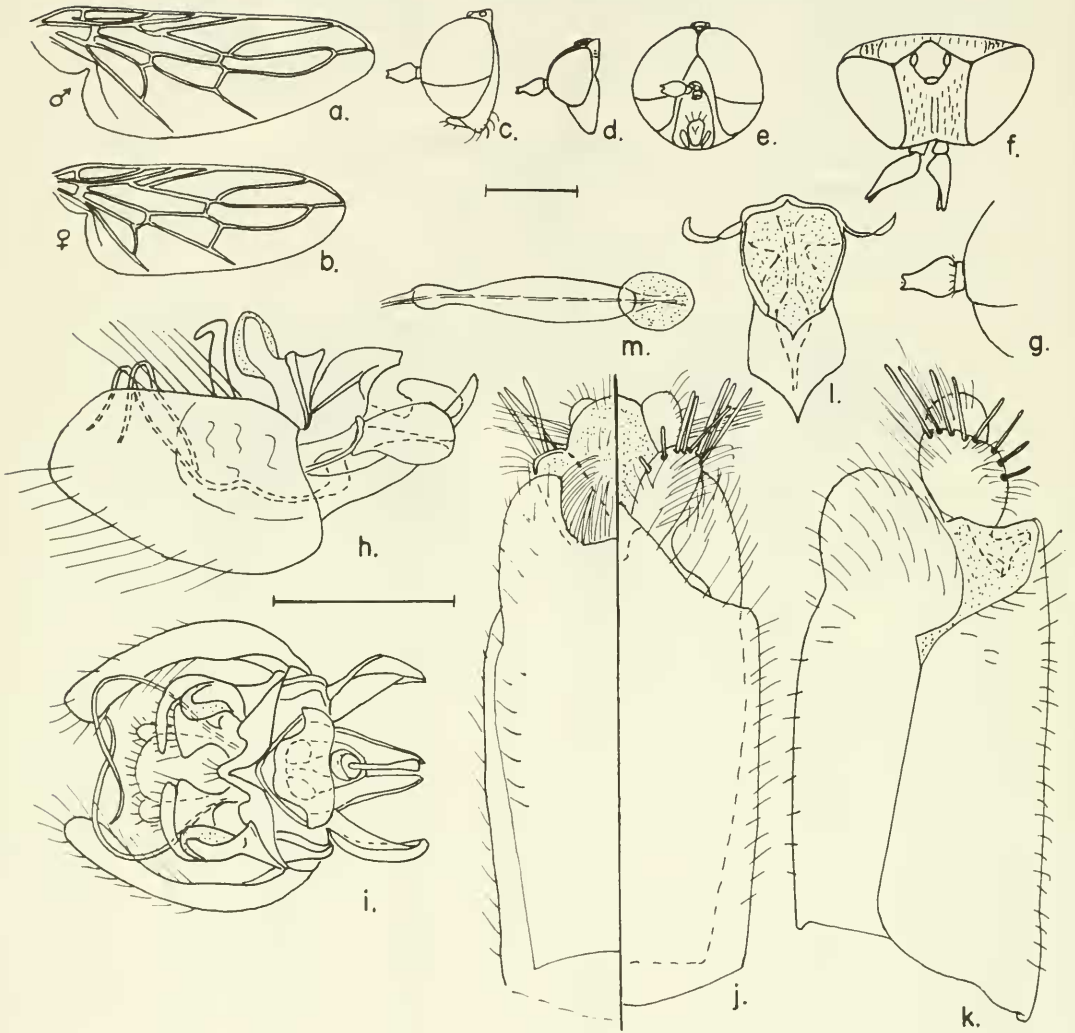


FIGURE 23. *Brevitrichia piscifonta* Kelsey, new species, male and female: a. and b., male and female wings; c. and d., lateral aspects of male and female heads; e., frontal aspect of male head; f., enlarged dorsal aspect of female head; g., enlarged detail of antenna; h. and i., lateral and ventral (physically dorsal) aspects of male terminalia; j., dorsal, right, and ventral, left, aspects of female 8th and 9th segments; k., lateral aspect of female 8th and 9th segments; l., female bursa; m., accessory gland.

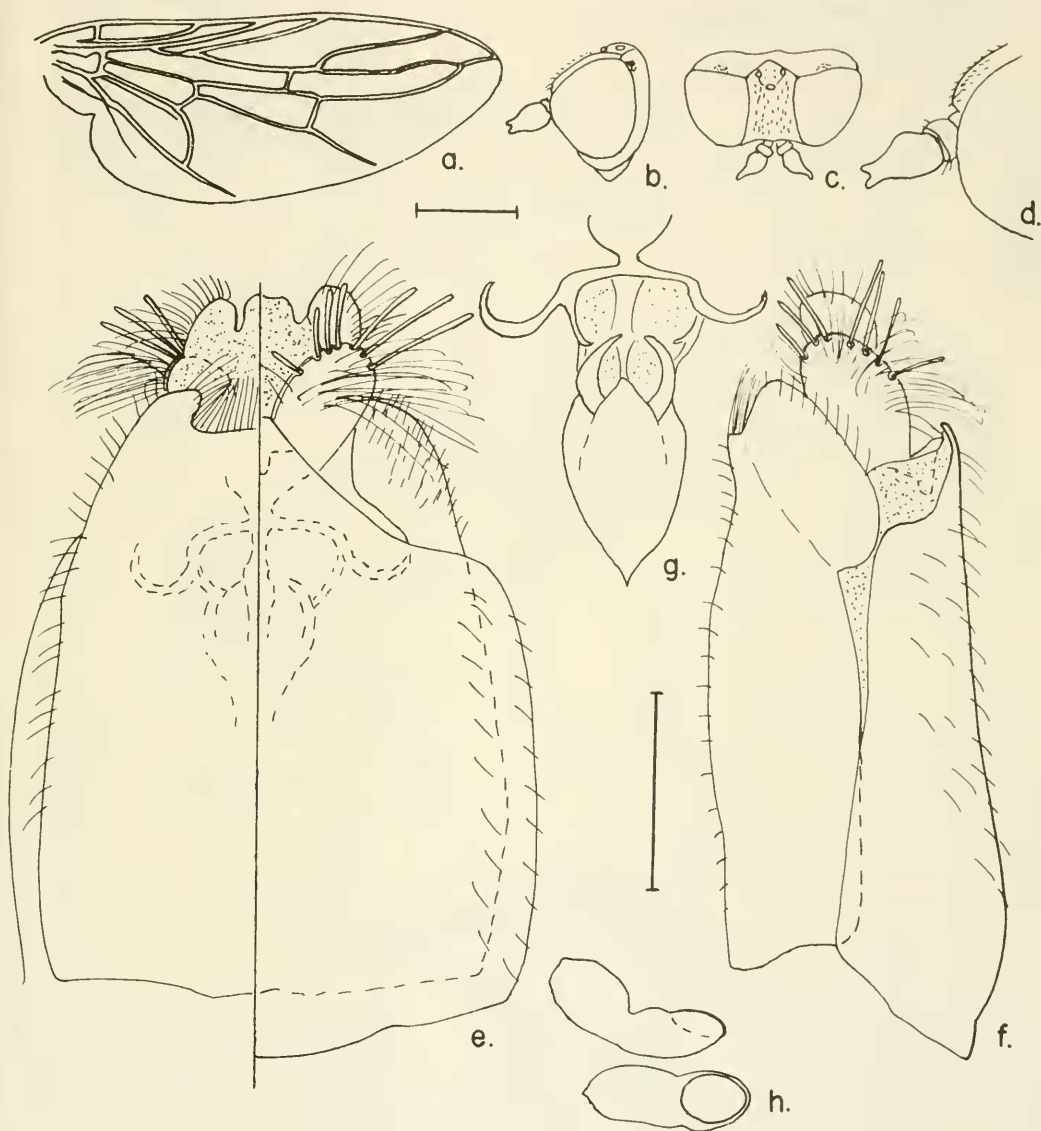


FIGURE 24. Brevitrichia septispina Kelsey, new species, female: a., wing; b. and c., lateral and dorsal aspects of head; d., enlarged detail of antenna; e., dorsal, right, and ventral, left, aspects of 8th and 9th segments; f., lateral aspect of 8th and 9th segments; g., bursa; h., spermathecae.

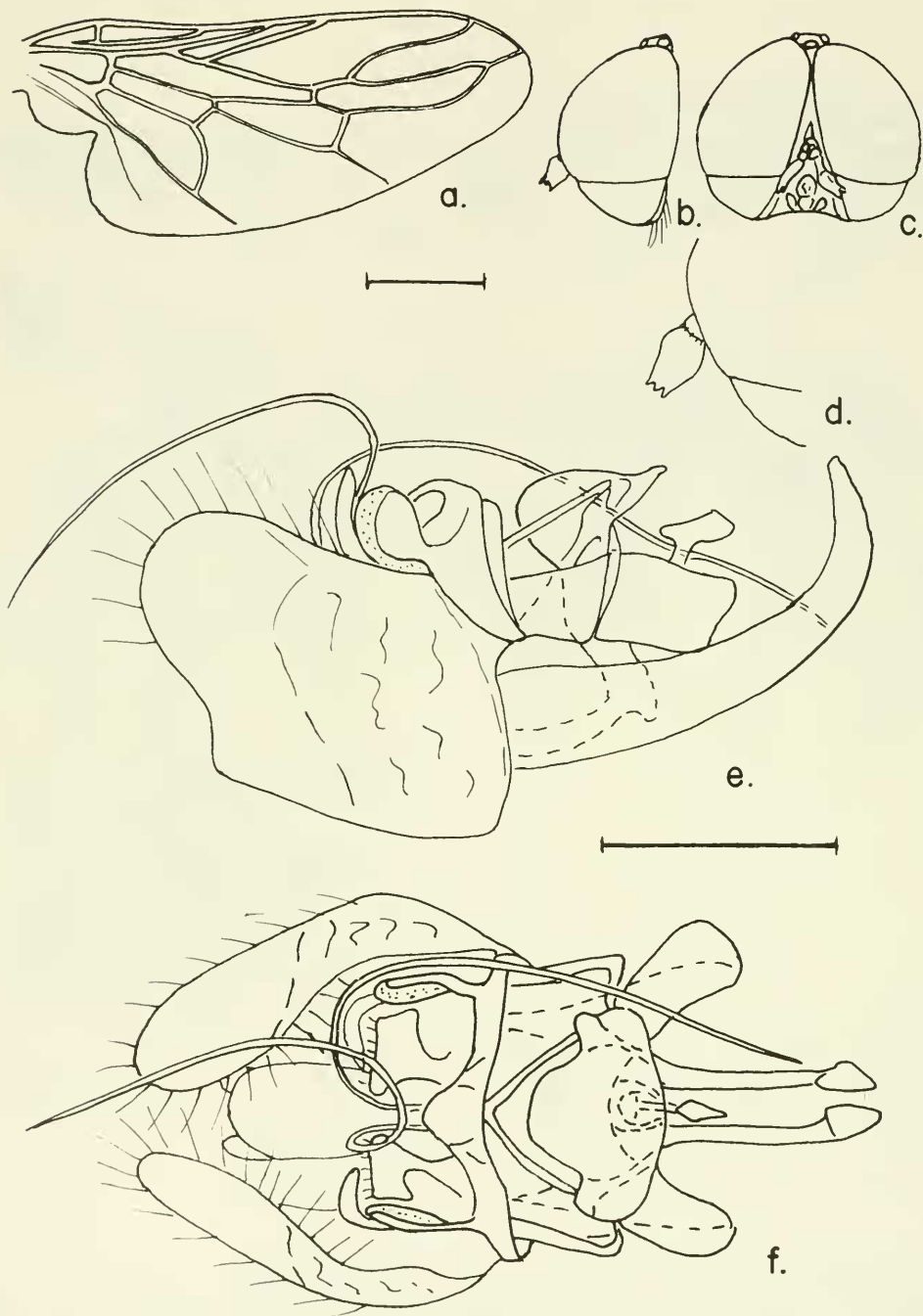


FIGURE 25. *Brevitrichia wilcoxi* Kelsey, new species, male: a., wing; b. and c., lateral and frontal aspect of head; d., enlarged detail of antenna; e. and f., lateral and ventral (physically dorsal) aspects of terminalia.

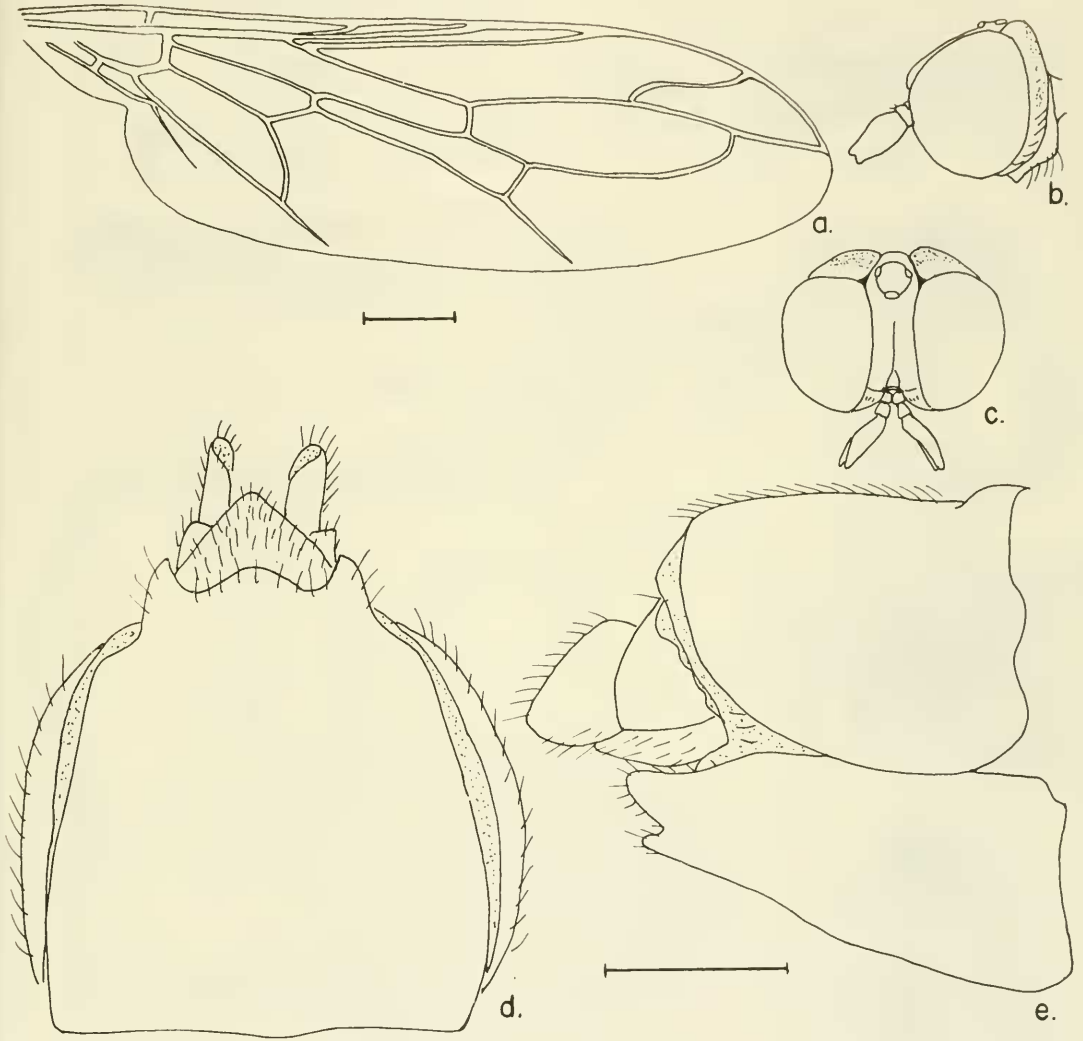


FIGURE 26. Pseudatrichia idahoensis Kelsey, new species, female: a., wing; b. and c., lateral and dorsal aspects of head; d. and e., ventral and lateral aspects of 8th and 9th segments.

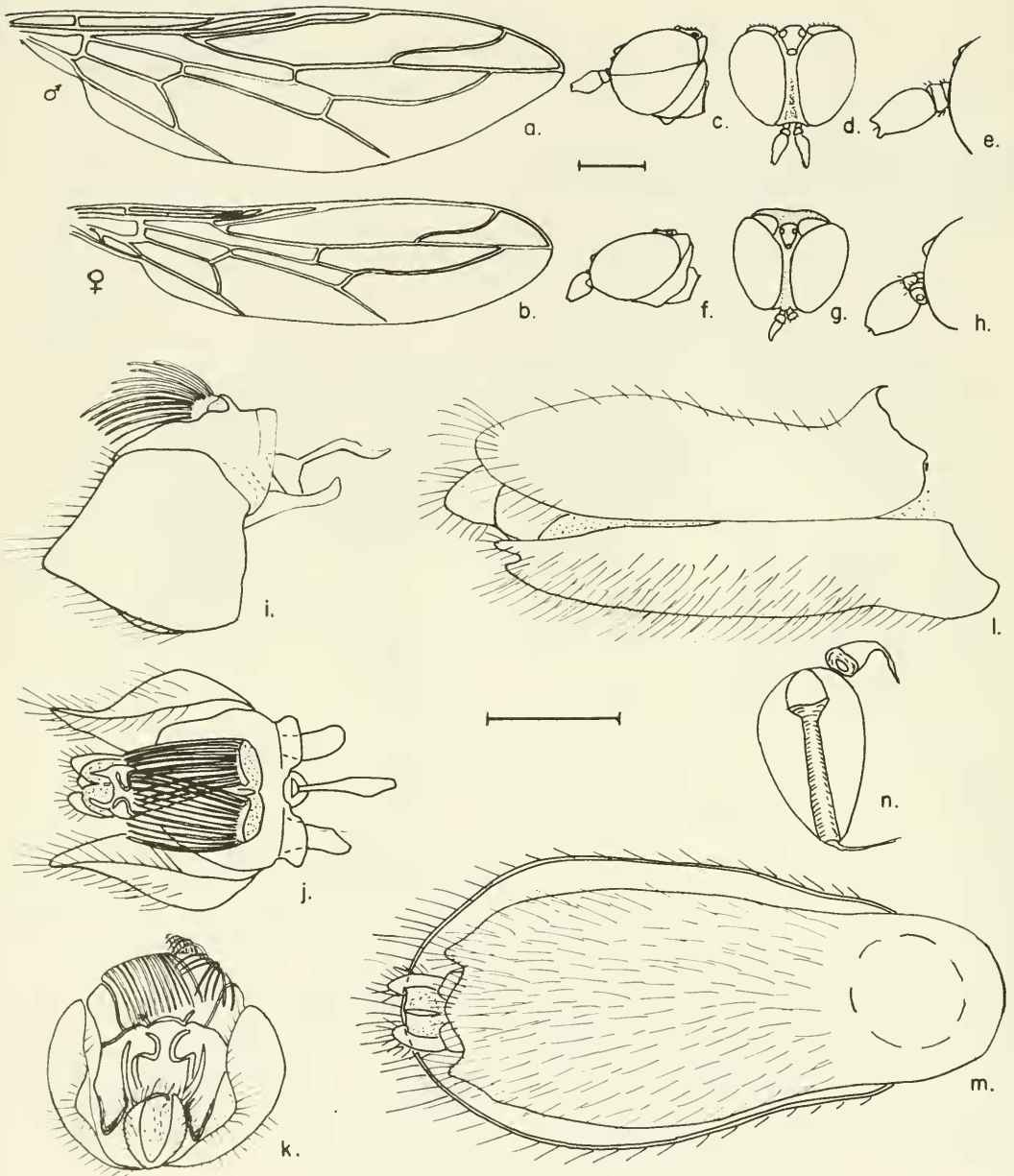


FIGURE 27. *Pseudatrichia rufitruncula* Kelsey, new species, male and female: a. and b., male and female wings; c. and d., lateral and dorsal aspects of male head; e., enlarged detail of male antenna; f. and g., lateral and dorsal aspects of female head; h., enlarged detail of female antenna; i., j., and k., lateral, ventral (physically dorsal), and posterior aspects of male terminalia; l. and m., lateral and ventral aspects of female 8th and 9th segments; n., spermatheca.

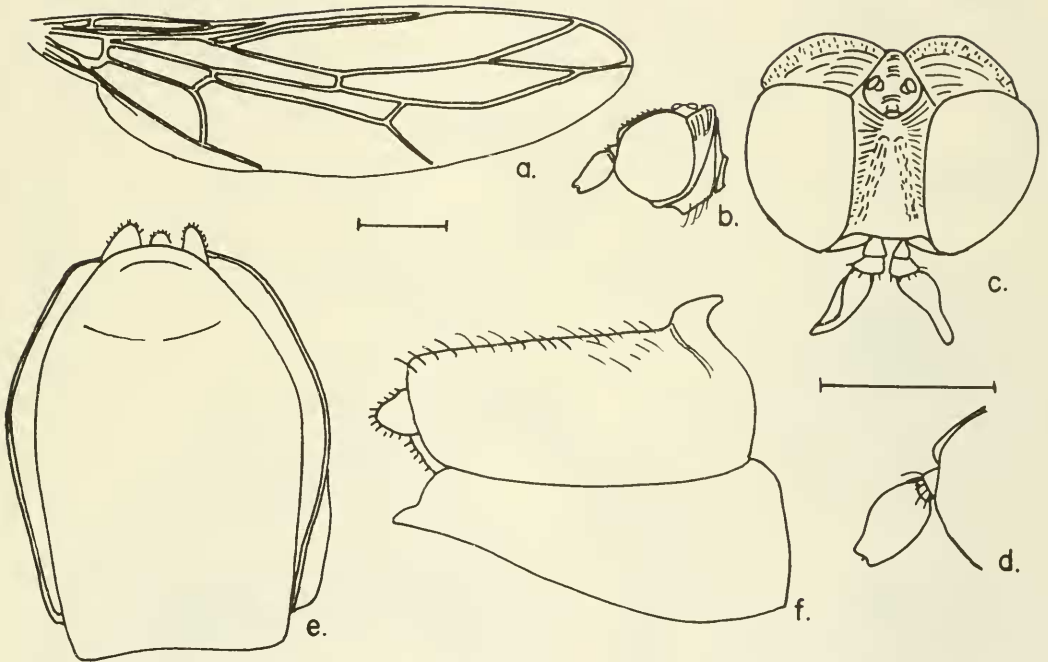


FIGURE 28. Pseudatrichia schlingeri Kelsey, new species, female: a., wing; b., lateral aspect of head; c., enlarged dorsal aspect of head; d., enlarged detail of antenna; e. and f., ventral and lateral aspects of 8th and 9th segments.

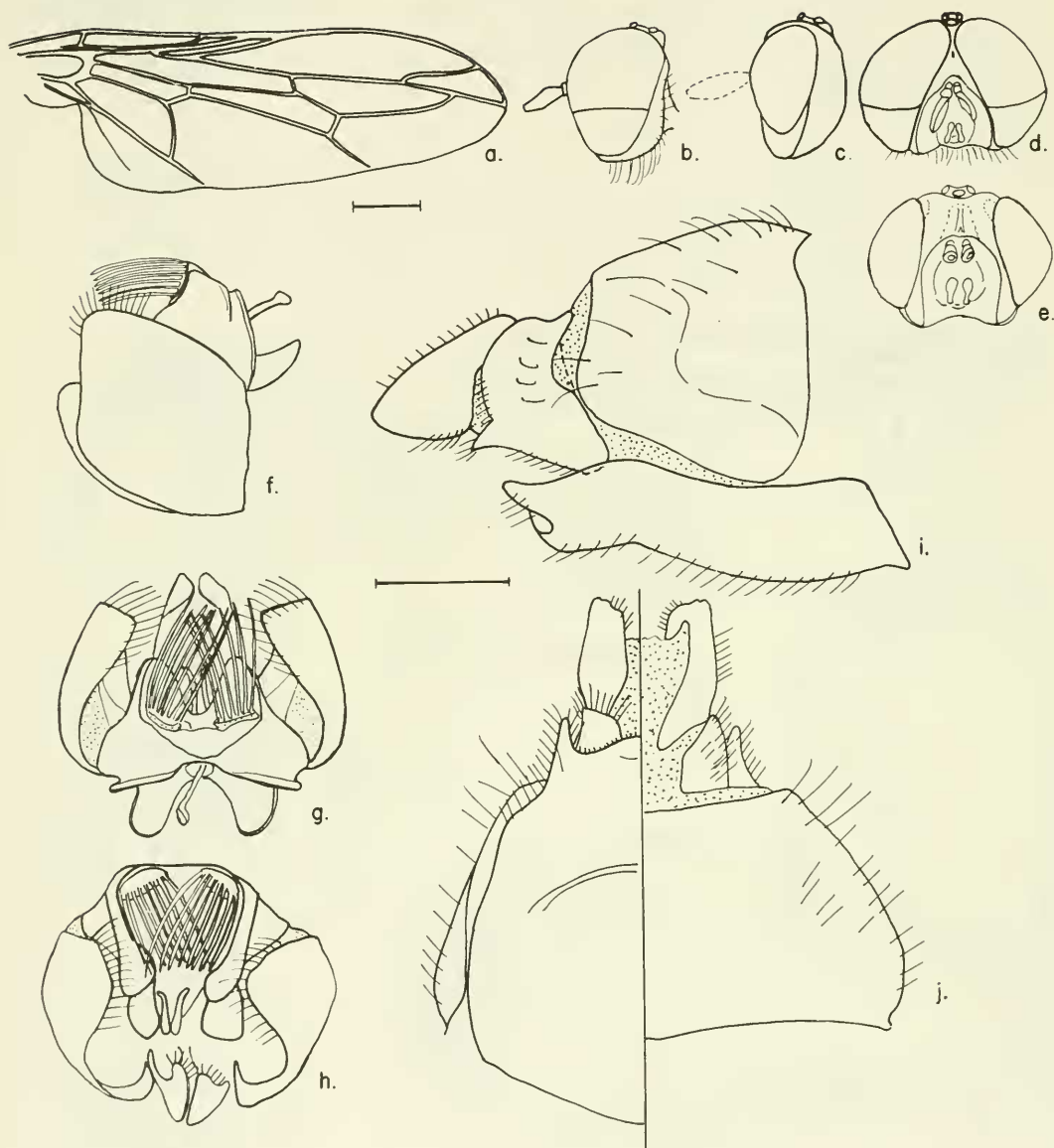


FIGURE 29. Belosta albicomula Kelsey, new species, male and female: a., wing; b., c., d., and e., lateral and frontal aspects of male and female heads; f., g., and h., lateral, ventral (physically dorsal), and posterior aspects of male terminalia; i., lateral aspect of female 8th and 9th segments; j., dorsal, right, and ventral, left, aspects of female 8th and 9th segments.

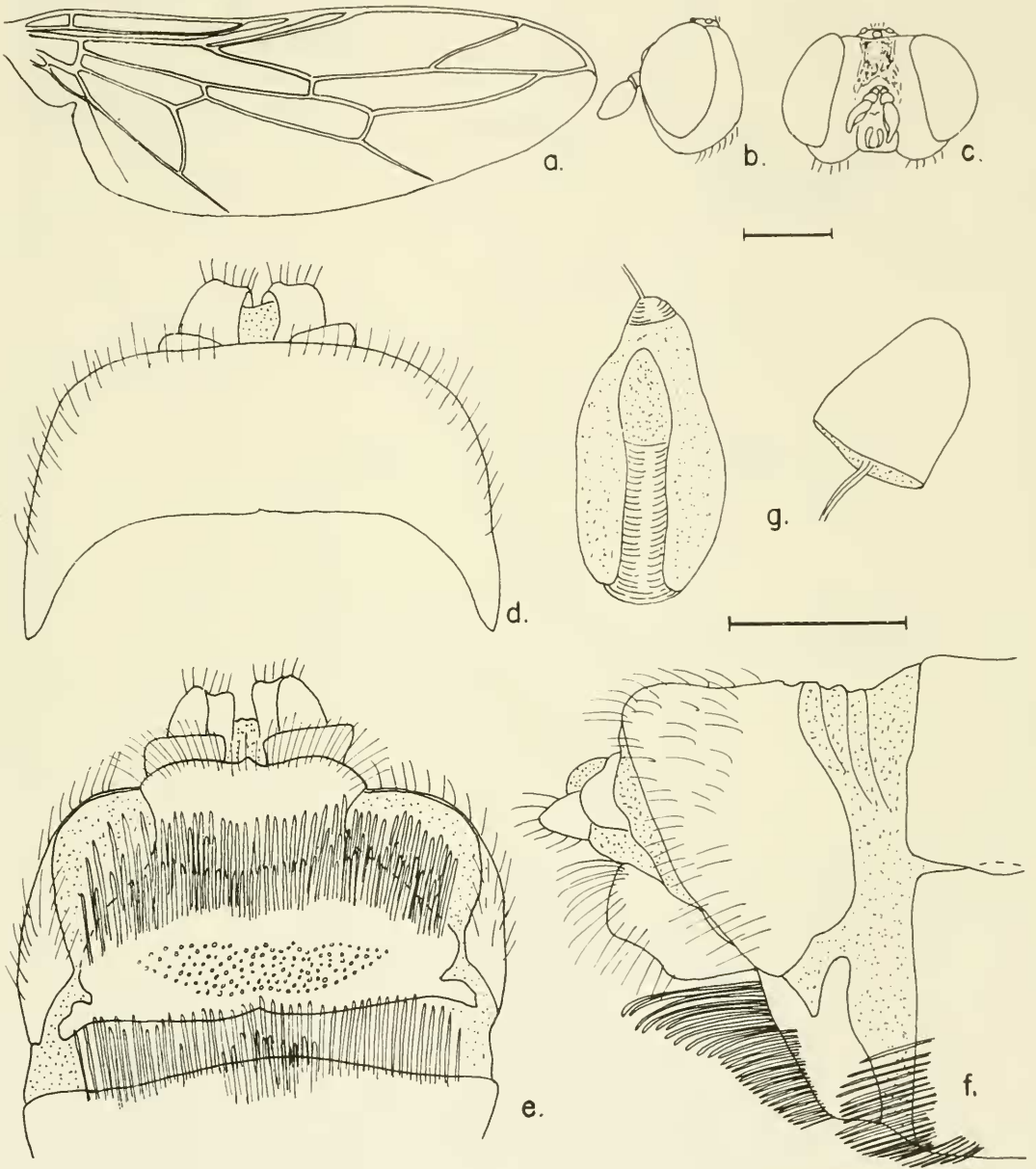


FIGURE 30. *Belosta scutumacula* Kelsey, new species, female: a., wing; b. and c., lateral and frontal aspects of head; d., e., and f., dorsal, ventral, and lateral aspects of 8th and 9th segments; g., spermathecae.